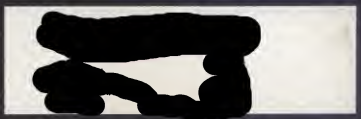
4th Annual Windows **Mega Issue!** You Gotta Have It!

OCTOBER 1995

PC Computing

Windows 95 SUPERGUIDE

All the Inside Information Microsoft Left Out!



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Introducing new Microsoft Office
for Windows 95

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Cache External	256KB (optional)	256KB	256KB
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Video Memory/Max.	1MB/2MB	1MB/2MB	1MB/2MB
Compaq 150 Color Monitor	Yes	Yes	Yes
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	4	5
Drive Bays (Total)	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes
Software	Windows 95 or MS-Windows* 3.1	Windows 95 or MS-Windows 3.1	Windows 95 or MS-Windows 3.1
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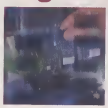
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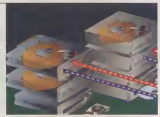
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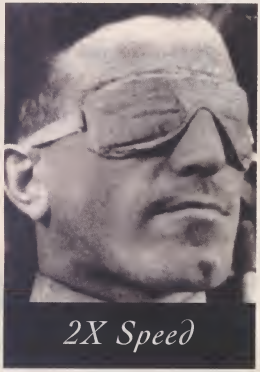
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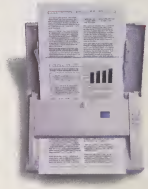
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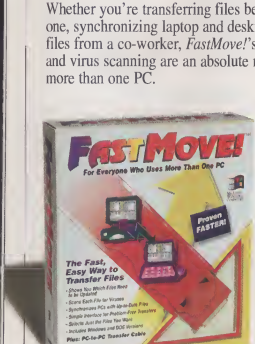
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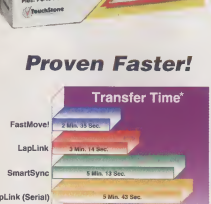
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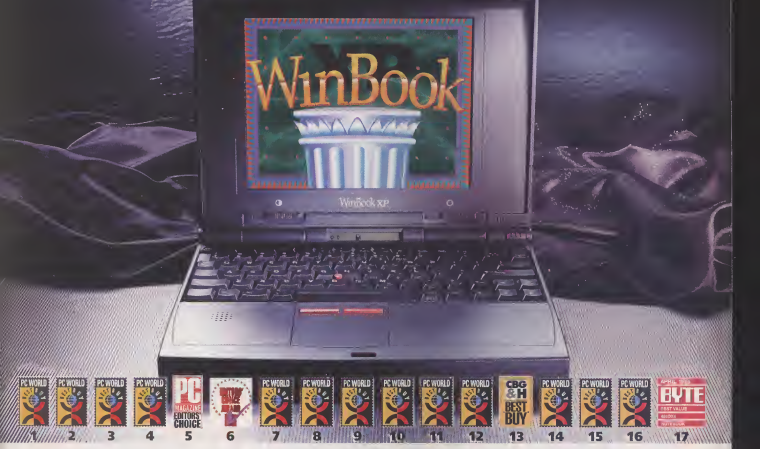
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Is it safe yet? Before Anthony Hopkins's Hannibal Lecter made it impossible to order "fava beans and a nice Chianti" with a straight face, the award for the most sadistic performance in a major motion picture would have gone to Laurence Olivier in *Marathon Man*. He portrayed an ex-dentist who, having graduated from extracting teeth to extracting information, kept repeating the same question as he probed deeper and deeper into Dustin Hoffman's molars: "Is it safe yet?"



It's Time: Ramp up to Windows 95.

With the long-awaited arrival of Windows 95, millions of PC users are asking that same question. You know you're going to upgrade to Windows 95. The only question is when. And for most people, the answer is in Lord Larry's question: Is it safe yet?

Well, upgrading to Windows 95 isn't quite plug and play (and neither is Plug and Play—more on that in a minute), but it's not as bad as a root canal without novocaine, either. And thanks to 32-bit versions of Symantec's safe-computing tools (see pages 112 and 116 for our sneak previews of Norton Utilities and Norton AntiVirus for Windows 95), your list of excuses to keep stalling is shrinking.

Plug and Play? It was supposed to do for hardware what the Windows interface did for software: Make it all point-and-click simple. The good news about Plug and Play is that when it works, it works. The bad news? It doesn't always work. Get the whole story in "Plug and Play Exposed" (page 198).

Under Cover: Fortunately, our fourth annual Windows Superguide (page 137) is here. More than just another guided tour of the operating system, our Superguide—along with exclusive excerpts from Ed Bott's *Using Windows 95* (Que, 1995), starting on page 221—will show you how to hit the ground running and make Windows 95 even more powerful and comfortable than Windows 3.x. OK, *now* it's safe.

On Assignment: For the past several months, Ed Bott's countdown to Windows 95 has graced our back page. Now that the wait is over, Ed is focusing on stories that help you get more from your PC (like this month's Superguide). And while you might notice that columnist Gil Schwartz is missing, stay tuned. Meanwhile, be sure to check out our new back page: "HotList," our inside look at Internet bookmarks of the rich and famous. This month we salute none other than Internet aficionado Newt Gingrich.

Demo of the Month: After its attempt to buy the competition to its financial software fell apart, Microsoft decided the next best strategy was to give away Money. Observes Associate Editor Rich Schwerin, "The new version of Money proves you can, in fact, teach an old dog new tricks. And the price is certainly right. But the software is only a smoke screen for the real battleground: online banking and commerce. What Microsoft and Intuit really want is the transaction revenue stream. A couple of years from now, they hope to get a cut every time you even *think* about buying a double latte." Check out our sneak preview of the new Money, on page 111, along with our take on e-banking, on page 44.

Start

To Get a Clear Picture of What Windows® 95 Can Do,



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Viewable Area	13.7"	14.0"	16.2"	16.2"	15.7"	19.1"
Dot Pitch	0.28mm	0.27mm	0.27mm	0.27mm	0.25mm	0.25mm
Recommended Resolution	1,024 x 768 @ 69Hz	1,024 x 768 @ 75Hz	1,024 x 768 @ 85Hz	1,024 x 768 @ 85Hz	1,280 x 1,024 @ 77Hz	1,280 x 1,024 @ 77Hz
TCO Certified	Yes*	Yes	Yes	Yes	Yes	Yes**
Speakers	--	Bezel Integrated	Bezel Integrated	--	--	--

*Note: 15GS/17 mm
**Note: 21PS/17 mm

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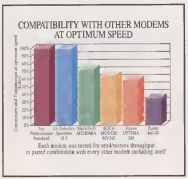
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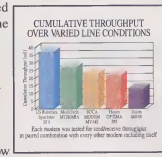


Any modem can enhance its connection success rate by reducing speed. So the labs compared the modems' success when connecting at optimum speeds over a spectrum of line conditions.

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SPORTSTER TOPS IN THROUGHPUT, TOO.

Finally, the labs compared which modems transmitted the most data under the widest array of line conditions. Once again, U.S. Robotics' Sportster came in first, delivering up to 177% more data.



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WINDOWS 95 CONVERTS THE WARPED

Eating Crow

Last March I got Warped! Finally, an operating system that I could live with, and one that's 32-bit, to boot. Would Microsoft's Windows 95 do all that? I was sure it would be buggy and ill-behaved, and not even 32-bit. But, just for kicks, I decided to take Microsoft up on its offer: I bought the preview version of Windows 95 and installed it. What did I learn? Windows 95 is not buggy. In fact, it hardly crashes (far less than OS/2 does), it is very well behaved, and what the heck—it *is* a 32-bit operating system. Eating crow is not much fun. But playing with Windows 95 is a blast.

BRAUN TACON
VIA THE INTERNET

Risky 32-Bit Business

I depend on my computer every day. I remember only too well the debacle of DOS 6.0. (Yes, I was one of the fools who rushed right out to get it.) I lost a hard drive to DoubleSpace and two weeks of my time before I got my system up and running again. I will never buy another Microsoft product right after its initial release. Windows 95 may have some tricks to offer, but until confidence in it increases, it's just too great a risk for the professional to take so early. Besides, until 32-bit versions of the applications I use are available, what's the point?

RICK A. DIAZ
VIA THE INTERNET

Running on Empty

When do I plan to upgrade to Windows 95 (Mail, July, page 28)? When it works, that's when. What good is an operating system with 32-bit code and preemptive multitasking when there are no 32-bit applications available, and when it can't even run 16-bit apps as quickly as Windows for Workgroups? I can't justify plunking down the better part of $100 for a slick and ultrahip user interface while I wait for the real 32-bit apps and subsequent "bug fixes" to make their way to the shelves. If Microsoft sold sports cars, it would have us buying Ferraris on the promise that someday it would open a gas station.

JOE ROBERTS
VIA THE INTERNET

May the Best System Lose

When does Robert L. Hummel receive the Lemming of the Year award for his comparison of Windows 95 and OS/2 (Crossroads, July, page 186)? Why the verdict "Windows 95 by a Mile"? According to his own pros and cons list, OS/2 is a better product. The verdict should read, "Windows 95 will likely wind up with more market share, despite numerous technical shortcomings. OS/2 will gain steadily as more and more buyers

"Should I be charging more?"

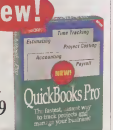
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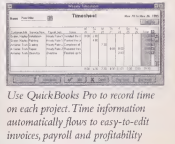
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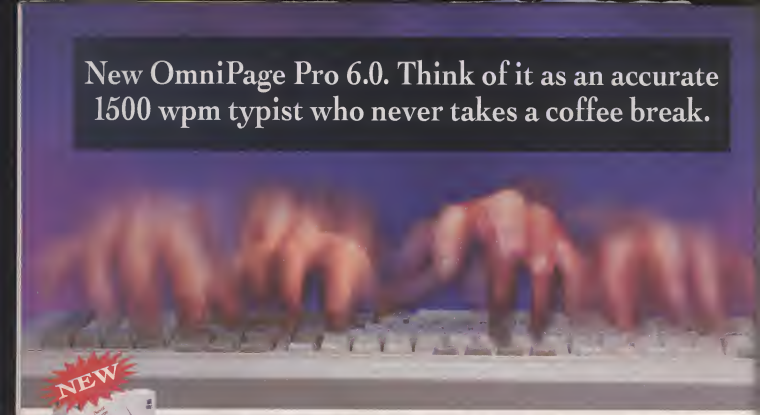




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become fed up with Microsoft's hard-nosed arrogance (which is already surpassing that of the IBM of yore) and its bug-ridden software."

TIM REEDY
VIA THE INTERNET

WHO EVER SAID the best technology wins? In case you haven't noticed, VHS beat Betamax. **YL**

Finally—Truth in Advertising

Microsoft did it, Symantec did it, IBM did it with OS/2 Warp, and Describe did it with its word processors. Now IBM/Lotus is doing it. Of course, I'm talking about charging money for a beta release of software. Instead of considering it arrogance and greed on behalf of the software publisher, I see it as truth in advertising. Software companies are finally admitting that the first version they sell is buggy, instead of advertising it as a debugged version 1.0.

JOHN ELFTMANN
VIA COMPUSERVE

Hard Drives, Harder Installation

In "Gotta Get a Gigabyte" (July, page 130), I found it funny that hard drives are sent without manuals or, in some cases, even without a tech sheet. When I purchased SIMMs for my machine, they came with a VHS cassette describing installation. Can you believe it? A plug-in, easy-as-pie module comes with a video. But hard drives, with their jumpers and configuration hassles, come with nothing. Strange, but thanks to your magazine, I might get the job done.

DAVID TOBKIN
VIA THE INTERNET

Too Early for Tips

I think the Windows 95 tips in your August issue are a little premature ("1,001 Keyboard Shortcuts," page S1). Most users won't upgrade immediately. I, for one, do not plan to upgrade until I know all is well and that all of my current applications will continue to operate. I do enjoy *PC Computing*, but sometimes your information is just too far ahead of most users.

EDWIN E. DUDENHOEFFER
VIA THE INTERNET

WE DESIGNED this article to help readers who couldn't wait to move to Windows 95, and to serve as an ongoing reference for those who will be upgrading to the new operating system a year from now. **BFM**

In Defense of NetCruiser

I use NetCom's NetCruiser and agree with your criticism of its bundled applications ("One-Click Internet," July, page 114). However, the point is moot because the current version (1.6) provides a Winsock that permits full use of other, superior clients for FTP, Web browsing, e-mail, and other Internet applications. Many of these apps are either freeware or shareware, and virtually all of them can be downloaded easily. With the enormous number of Internet packages out there—such as Netscape, Eudora, and Free Agent—choosing a package solely by its individual client applications would be as silly as selecting a desktop computer system solely by the software bundled with it. Select an Internet package based on value, stability, and compatibility with third-party apps, and the best of all worlds will literally be at your fingertips.

LORY DAVID WIVIOTT
VIA THE INTERNET

Net Message: Easy E-mail

I was astonished at your NetCruiser review in the July issue, particularly your assessment of e-mail addresses. To send this message, I simply typed the address into the address space; I did not set up a separate entry in an address book—and this has been in place since version 1.0. Although I agree that NetCom should make more search tools, I have had no problems navigating the Web, FTP, Gopher, or anything else with NetCruiser.

JIM BLAKE
VIA THE INTERNET

Feeling Locked Out

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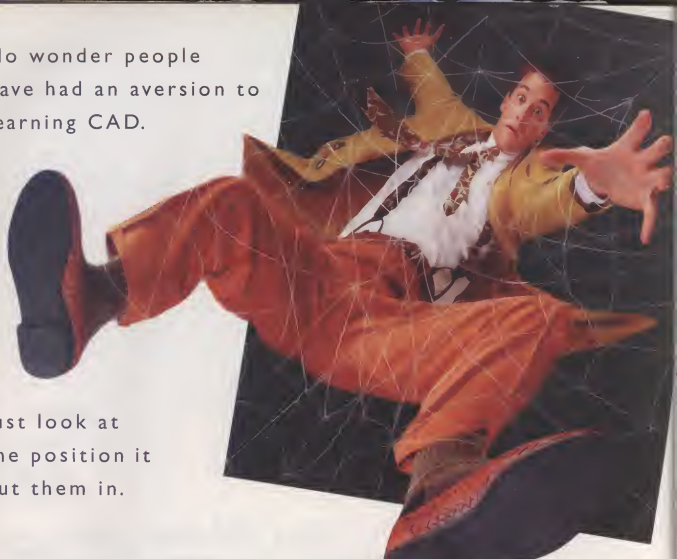




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delighted. As a new subscriber to America Online, I was looking for information that would help me get the most out of the Internet. I was disappointed to discover that the headline actually referred to Internet software reviews and did not help the newcomer with online services at all.

GENE BRICKER
VIA THE INTERNET

YOU WANT IN? Stay tuned. Next month's "Underground Internet" feature will tell you all about Net secrets and sites you won't find in regular guidebooks. Our July feature was to help newcomers find the most usable access package. **DM**

Don't Nix Net Access on Unix

You tend to focus on the major service providers as the only way to get on the Internet in "One-Click Internet." I've never used a major service provider. I prefer a Unix command prompt to every other menu system I have seen. Using the Web is difficult, but it can be overcome. The Internet was created on Unix machines. At colleges and universities across the nation, as well as in government and business, people access the Internet through noncommercial means. Not mentioning Unix shell accounts as a possibility is shortsighted on your part.

WARREN SCOTT OVERHOL
VIA THE INTERNET

ONE WORD: *USABILITY.* There are dozens of better, easier, and more complete Windows-based I-Way interfaces available that have surpassed the character-based trauma of 20 years ago. **RS**

No Free Launch

Why do you people keep telling us that Netscape Navigator is free ("Untangle the World Wide Web," April, page 52)? It is free to students, faculty, and staff members of educational institutes, as well as to employees of charitable nonprofit organizations. Other users are allowed to try out the software for 90 days, but then they must buy the commercial version. The license agreement can be found on ftp.netscape.com in the /pub/netscape/windows/ directory. The file is called license.

MATT LEESE
VIA THE INTERNET

RIGHT YOU ARE. Netscape now sells Navigator for $39, and it's free only for noncommercial use. **RS**

IBM's Reverse Psychology

I have a conspiracy theory, but it's not about Microsoft (for once). If IBM bought Lotus, then IBM owns a whole bunch of OS/2 applications. Could it be that IBM will re-release SmartSuite/2 as a SuperBonusPak? And then it will bundle OS/2 version 4.0 with an IBM PowerPC? This is IBM's conspiracy to take over the computing industry by not making any money at all. Oh, it's insidious all right, selling only loss-leaders, but it just might work!

DAN KNUDSEN
VIA THE INTERNET

Business as Usual

In your August issue, you ask what will happen now that IBM is buying Lotus (Mail, page 41). My guess is that nothing out of the ordinary will happen. IBM will absorb Lotus into its vast, corporate, bureaucratic, too-big-to-succeed structure, and that will probably be the end of the whole story. Except that there will be a precipitous decline in the market share of Lotus software, of course.

ROD DIXON
VIA THE INTERNET

Drawing Conclusions

In your May feature "Maximum Impact" (page 114), you state that high-end desktop publishing is still dominated by the Macintosh. Your readers may infer that to get the best desktop publishing results, they have to have a Mac. As a graphic designer, I used to work on a Mac. Then I landed in the PC arena. Not many designers go from Mac to PC. But the PC gives me the same software (in most cases), the speed I've always dreamed of, and, best of all, it costs less. I replaced my Mac IIfx with a 90MHz Pentium, and clients can't tell the difference. Creativity doesn't come in computer boxes. Computer equipment is just an instrument, and you can produce

"Did I *really* make any money on that job?"

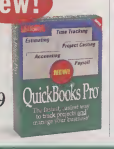
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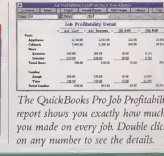
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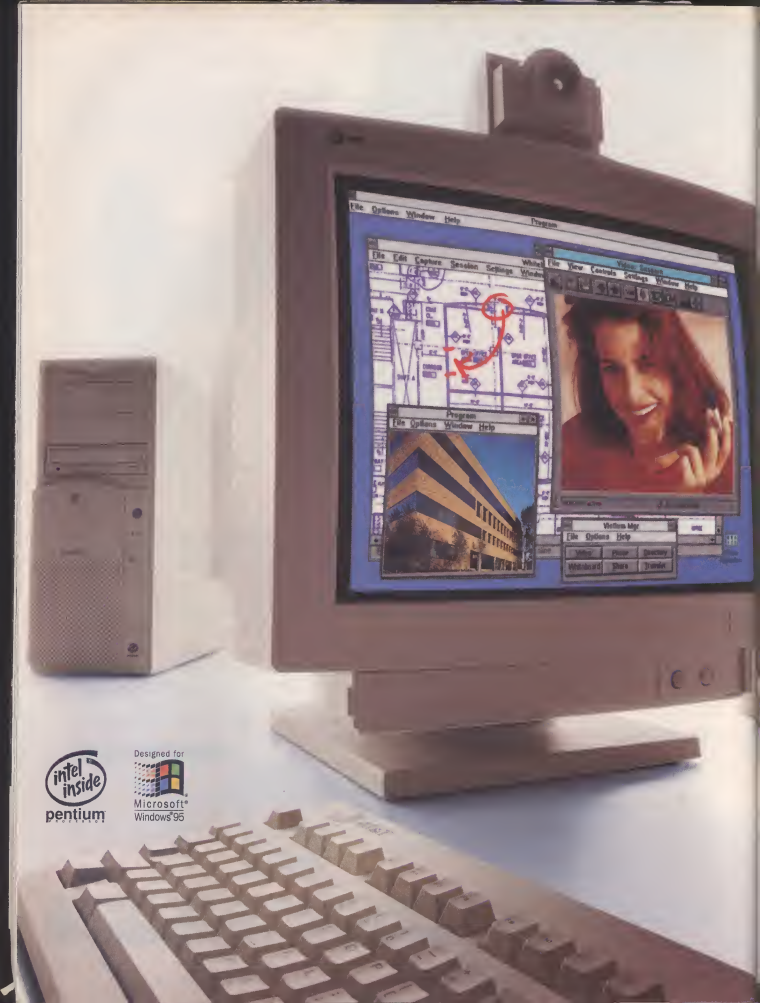
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DOMINATED, YES. Better, no. The vast majority of service bureaus and professional shops are hanging on to their Mac hardware and software. But the PC is indeed gaining ground. Windows 95 should help, too. **JOC**

Not So Fast

I'm shocked at your July review of graphics accelerators ("The Fastest True-Color Cards," page 157). Matrox Graphics' MGA Impression Plus, which you select as the Best Buy, has the worst DOS performance of any graphics card this side of EGA. I realize that this article was about Windows graphics accelerators, but a fact this staggering needs at least a passing mention. This card makes Doom II: Hell on Earth seem like Heck in an Old-Folks Home.

KEITH CALSYN
VIA THE INTERNET

SO TAKE UP MYST. The MGA chip on the Impression Plus is undeniably slower under DOS than many of the other cards we tested. But if you spend more time in Windows than at the C:\ prompt, the Impression Plus is a steal. For better DOS and Windows performance, check out Matrox's follow-on to the Impression Plus, the MGA Millennium (see "Graphics for the Next Millennium," page 90). **WT**

Fighting for Free Speech

I would like to congratulate Paul Somerson for a job well done on his column "Senator Cybersexon" (June, page 55). Despite the fact that the Communications Decency Act was passed, Somerson probably helped influence those who did vote against this awful law that seriously violates our First Amendment rights. Somerson is a pugnacious writer with wonderful style. Give him more space for his inspiring columns!

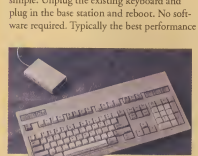
GAVIN HOLLAND
VIA THE INTERNET

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Big Brother vs. Sex Online

Because the government has enough problems trying to quell or regulate tangible things, I am fairly confident that it won't have much of a chance of regulating something as wonderfully intangible as the Internet. It will be, and is, a snap to police online services such as America Online and Prodigy. These services monitor themselves. I'm not saying that people who post unlawful pornography shouldn't be stopped, but I don't want to see an Internet where police officers and FBI agents monitor your words on their screens. Has anybody read George Orwell's *1984* lately? That story is much scarier than anything vulgar or distasteful on the Internet.

RICHARD PERRY
VIA AMERICA ONLINE

Technology Takes a Lesson

In his amazing letter in the July issue, Merlin Wright writes, "I'm glad no one was around to censor the Holy Scriptures and remove everything they thought was objectionable" (Mail, page 28). Does the Council of Nicaea ring any bells? At that meeting in 325 A.D., church officials threw everything they considered objectionable out of the Scriptures. Power up your CD-ROM encyclopedia and look it up. I don't have an Internet address either. I do have an education. I believe education is more important, especially if the Internet is just a more efficient means for ignorant people to spread misinformation.

DAN FREEMAN
OAKLAND, CALIFORNIA

Give This Bill a Break

John C. Dvorak's August column ("Just Not Intuit," page 65) was another scathing attack on Microsoft. I'm beginning to believe that you've lost touch with a large group of people who enjoy what Microsoft has given them. Microsoft plans to package its online software free to PCs with Windows 95. Other online services offer free software too, but I don't hear any complaints about that. All this whining by Bill Gates's competitors and detractors demonstrates a childishness born of nothing more than plain old envy.

STANLEY J. CARRINGER
GAHANNA, OHIO

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Infection Prevention In The New World.



First, Windows 95 doesn't have any virus prevention or protection built in.

And on the networked, file-sharing superhighway of life, the chances that your PC will be exposed to a virus are far greater than you might think.

And guess what? Your old anti-virus software won't work in the brave new world of Windows 95. But thousands of old viruses will.

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But you need more than just protection from a long list of known viruses. Which is all that ordinary anti-virus packages can offer.

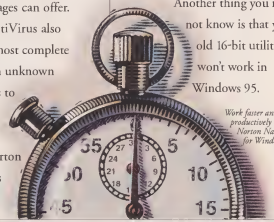
Norton AntiVirus also offers you the most complete protection from unknown viruses. Thanks to our unique virus detection technology, Norton AntiVirus spots virus activity in your system and eradicates it before it can do any serious damage.

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And when could you possibly need protection from unknown viruses more than in a brand-new operating system?

A 32-Bit Operating System Demands 32-Bit Protection.

Another thing you may not know is that your old 16-bit utilities won't work in Windows 95.



Work faster and more productively with Norton Navigator for Windows 95.

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And the utilities included in Windows 95 itself won't give you much protection in a 32-bit world.

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The first thing Norton Utilities will do for you is optimize your system for Windows 95 with a Pre-installation Tune-up.

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Norton Utilities keeps your data safe from harm.

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Windows 95 has lots of terrific features to make life easier. Like Plug 'N Play. And long file names.

You can plug into your Internet connection right from the Norton File Manager. Search for text strings within files at least ten times faster. (In fact, the more files you have and the bigger they are, the more time you'll save.)

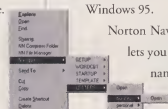
And copy a file anywhere on your hard drive or on the network with just one click. Instead of click click click click click click (are you tired of clicking?) click click click. Which is generally how long it takes to copy a file in Windows 95.

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But what about getting even more out of Windows 95? Like getting more done in less time.

With Norton Navigator, you can navigate through your desktop five times faster than in Windows 95. Be more productive with multiple project-oriented desktops. Open the files you need most in a single click.

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Norton Navigator also lets you use long file names for most 16-bit applications. And gives you loads of other time-saving tools like built-in PK-Zip compatible file compression and the ability to delete, move, zip or encrypt from any Open or Save dialog box.

So why waste time wading up and down menus, clicking your life away? Every minute counts.

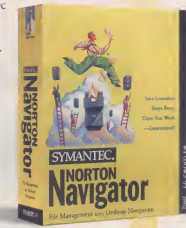




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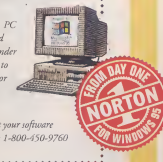
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Word to the Wise

In your April issue, Kyla K. Carlson raves about Microsoft Word 6.0 (Help, page 180). Yet Word 6.0 is painfully slow and has more bugs than my college dorm room. Please stop this painful trend of reviewing products in terms of their feature lists; Word 6.0 has more features than any application I know, and it's still the worst word processor I've ever used.

PAUL TOZOUR
SAN RAFAEL, CALIFORNIA

Return to Tender

If and when e-banking takes place, we will not live in a free society ("They're Going for your Wallet," Reality Bytes, April, page 150). Our banks will know everything we buy and everything we do. American money reinforces what this country stands for every time we use it: "The many are one or the one many." If we lose our currency, we will destroy this country.

NANETTE CAMPBELL
BOLTON, MASSACHUSETTS

MANY WOULD ARGUE that banks *already* know everything we buy and do. As for e-banking's marking the end of a free society, who are you kidding? E-banking is about convenience, not the death of currency. Cold, hard cash will be around as long as the IRS and law enforcement are around to tax and regulate it. **RS**

Plug and Employ

I do not have an overt hatred for Plug and Play, but I do have to side with Wing Gin Lam in his May letter (Mail, page 27). Plug and Play doesn't teach users how computers really work. I repair computers, and most problems that people have with their PCs stem from lack of computer knowledge. The problems may seem complex to some but are really quite simple in the right hands. The benefit of Plug and Play is that it keeps people like me employed.

ELI LISKO
VIA THE INTERNET

Windows 95: The Will of Bill

Ed Bott's Windows 95 conspiracy theory in his March column ("Ninety-something?" page 324) must still be playing games with his head. I have no problem with opinions on the Windows 95 release date, but this article made me laugh, especially the implication that Bill Gates controls the software industry in such a way that apps are released when he wants them to be. Is this man God? The only competition is in the mind's eye.

CHAD RODGERS
VIA THE INTERNET

For the Record

In our August review of personal page scanners ("Put Paper into Your PC," page 75), the screen shot of Delrina's WinFax Pro 4.0 was incorrect. Watch for a sneak peek of WinFax Pro version 7.0 in the November issue.

E-BANKING: EASY TRANSACTIONS OR EVIL CONTROL? Send your thoughts about this and other subjects to Mail, *PC Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax: (415) 578-7059; Internet: 72241.1724@compuserve.com; CompuServe: 72241,1724.

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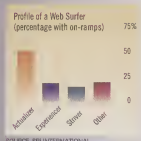
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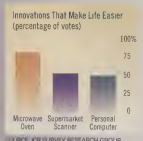
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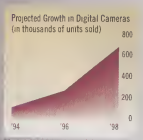
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Web Psychograph: Most Web users are actualizers: educated and innovative. Get complete survey results at http://future.sri.com.



SOURCE: ICR SURVEY RESEARCH GROUP

Makes My Day: Most 18-to-34-year-olds prize supermarket checkouts and microwaves over their PCs; fax machines and cellular phones follow.



*SOURCE: BIS STRATEGIC DECISIONS

Say Cheese: Not everything you want to copy fits in a scanner. That's why digital cameras are expected to have an annual growth rate of 70 percent through 1998.

E-CASH

Send Me a Cyber Check



Personal Automatic Teller Machine: Your bank wants to open a branch just for you—on your hard drive, that is.

Kiss your bank teller good-bye. And say farewell to your ATM, too. You won't be seeing much of them in the future, because your bank wants to open a branch in your PC—right next to your brokerage firm and credit-card company.

This fall, about four dozen financial-service providers—mostly banks—with a combined customer base of more than 40 million, are partnering with software developers to provide online financial services. You'll be able to dial into your bank's mainframe and check account balances, make transfers, pay bills, and do most of the other things you now do with a teller or ATM.

Although a few banks have tinkered with this before, none have been able to unlock a mass customer base. This is probably because they lacked easy-to-use online modules like the ones found in new versions of Intuit's Quicken, Microsoft's Money, and MECA's Managing Your Money. These new programs will likely revolutionize the way you manage your finances.

Like ATMs, online banking might be slow to catch on. But ATMs save bankers so much in overhead costs, they can't wait to take this next step into your PC. Expect most banks to follow Citibank's lead and reduce or eliminate fees for electronic banking, while gradually increasing charges for using a teller or ATM.

Pay bills with last-minute transfers from your checking account. Download electronic bank and credit-card statements—with your charges already categorized for tax and budgeting purposes. No more data entry, no more sessions with the calculator, no more matching piles of checks and receipts to statements that you have to warehouse for years.

These new programs will give you effortless control over your finances—check and credit-card transactions slip easily into expense-report

UPDATES Best Bets and Bargains

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The best browser gains 32-bit performance and drag-and-drop bookmarks ($39). Contact Netscape at (415) 528-2555.
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FILENAMES 95
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Reader Service No. 645

PHONEBOOK 95
Find fax and phone numbers fast with PhoneDisc Fax and PhoneDisc Business Lite ($30 each). Contact DDA at (800) 284-8353.
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PHOTO ILLUSTRATION BY PETER ALAN GOULD; PHOTOGRAPH COURTESY OF PHOTODISC

Upgrades for Windows 95

generators like Portable Software's QuickXpense. Talk about labor savings!

Someday in the not-too-distant future, your bank will offer memory-chip–equipped debit cards you can use even for nickel-and-dime transactions at convenience stores, fast-food outlets, and vending machines. Visa and MasterCard are also working together to make it safe to say "charge it" on the Internet. **MH**

Windows 95 Disk Cleaning As you contemplate the big switch to Windows 95, a few setbacks are to be expected. But installation problems are less likely to result from inherent flaws in the operating system than from unforeseen conflicts with old files and applications residing on your PC.

Remove-It 2 can help ease the Windows 95 transition by eliminating duplicate files and configuration scraps left on your hard drive by programs that departed long ago. It's especially helpful in maintaining your program groups and Windows 3.1 shell for dual-boot installations under Windows 95. When you're ready for Windows 95, the $40 Remove-It 2 from Vertisoft (800-380-2608) will be there to sweep away those old Windows 3.1 and DOS files. **MH**

Free Money Yes, you read that correctly. Microsoft has announced it will give away Money, its personal-finance program, through October 31. Microsoft Network subscribers can download it from MSN, or you can order the disks and manual from Microsoft for a $9.95 shipping fee. Contact Microsoft at (800) 426-9400. **RS**

Internet Safeguards

With **pornography** widely available on the Internet, CompuServe offers a browser with a **Crossing Guard** feature that lets adults audit their children's online visits. **SafeSurf**, an online parent's organization, is also building a **directory of URLs** that are **safe for children** and has unveiled a **rating system** so parents can easily identify a site's content. **MH**

Internet in a Box for Kids / CompuServe / (800) 557-9614 / info@spry.com or http://www.spry.com / $35 est. street price / *Reader Service No. 647*
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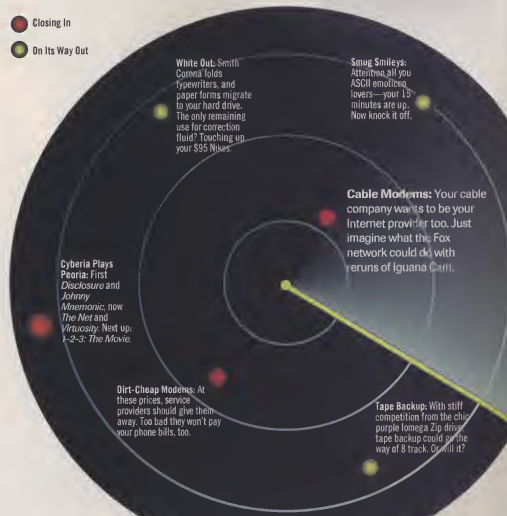
Why just spin discs when you can record your own? Here are the least expensive CD-Recordable drives we could find as of July 24.

Product	Price
Smart & Friendly CD-R 1002 *High Technology Distributing* *(800) 959-7001*	$1,499
JVC Archive *CompuAbility Consumer Electronics* *(800) 554-9950*	$1,599
Pinnacle RCD 1000 *Midland ComputerMart* *(800) 407-0700*	$1,629
Sony Spressa 920 *MidWest Micro* *(800) 972-4422*	$1,695
MicroNet 1x-Speed CD-R *DirectWare* *(800) 590-9273*	$1,699

Reader Service Numbers:
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RADAR: Typewriter Era Ends, Sniping at Emoticons

What's on the scope? If a blip is near or moving toward the middle of the radar screen, check it out. If it's moving off the screen, steer clear for now.





Share Your Docs On the Wall

Conference calls are great for constructive collaboration. But if you're presenting information or reviewing and editing documents, keeping a large group of people on the same page is about as easy as herding cats. While you don't necessarily need to share video, it would be nice to share the presentation or documents. Polycom's ShowStation lets you do just that.

ShowStation is a T.120-compliant document-conferencing projector that scans whatever document you're presenting, projects it in your conference room, and simultaneously transmits it to similarly equipped remote sites. With ShowStation's LCD, participants can share notes and comments about a document in real time, and—if equipped with Polycom's SoundStation—conduct a multipoint conference call at the same time.

So where do you sign up? Not so fast. Polycom's ShowStation will set you back a whopping $10,795. Each unit includes its own 33MHz 486 processor, 12MB of RAM, an 85MB hard disk, and a 28.8Kbps modem, as well as serial and parallel ports for plugging in a full-fledged videoconferencing system, printer, or other peripheral. **RS**

ShowStation / Polycom / (408) 526-9000 / $10,795 est. street price / *Reader Service No. 655*

Thwarting 32-Bit Infections

McAfee's Scan 95 scans, detects, and kills those pesky **32-bit viruses** that will inevitably crop up on your Windows 95 system (the same viruses your 16-bit virus-protection software simply can't handle). **Scan 95** is an early iteration of McAfee's **VirusScan for Windows 95,** which includes on-demand file scanning and automated virus removal. But for advanced features like InstantScan and ScheduledScan, wait for the full-featured VirusScan, or check out Symantec's Norton AntiVirus for Windows 95 (see "Virus-Proofing Windows 95," page 116). It costs more—$79 for Norton AntiVirus vs. $49 for Scan 95—but it's got you covered. **RS**



VirusScan for Windows 95 / McAfee Associates / (800) 866-6585 / $49 est. street price / *Reader Service No. 654*

APPROACH 96

Lotus Gives Databases a Good Name

SNEAK PREVIEW

The world's friendliest database program is about to get even friendlier. In our exclusive sneak peek at Lotus's Approach 96, we uncovered dozens of ease-of-use enhancements, plus new features that will satisfy even the most power-hungry database users.

Anyone familiar with Lotus's Freelance Graphics or Word Pro will recognize the new SmartMaster applications in Approach 96. These SmartMasters are full-featured applications that are up and running in no time. The number of applications was not finalized at press time, but you can count on SmartMasters for a loan-amortization calculator, meeting planner, contact manager, and order and customer manager, to name just a few. You can also customize each SmartMaster application and save it for future use.

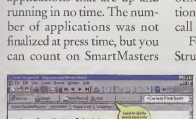
The most welcome feature for power users is the addition of LotusScript—a fully object-oriented programming language. You'll find object support for field boxes, text boxes, buttons, querying, and more. You can also easily integrate Approach 96 with other Windows applications—just use LotusScript to call other APIs.

For those who need access to Structured Query Language (SQL) data, there's now the SQL Query Assistant, which helps you define and store SQL queries. In addition, Approach will download predefined SQL server data, thereby increasing your speed of data browsing and reporting.

The Find Assistant, another new utility, will help you build complex queries without all the technobabble. Its operator uses plain-English commands, further enhancing usability.

On the CD-ROM version of Approach 96, Lotus provides additional features that aren't offered on the floppy disk. You'll find a zip-code database that contains zip codes from around the country. Type in a city, and Approach will tell you the zip codes that correspond.

Approach 96 wouldn't be complete without Internet support. The CD-ROM version is bundled with a World Wide Web database containing about 500 Web sites. Quickly link to these sites with the included Web browser. You can edit the sites in your Web database, add notes to them, and search for additional sites. And, of course, you can personalize the database with your own Web sites. **KKC**



SmartMasters: Approach 96 will ship with several SmartMaster applications designed to automate common database tasks.

Approach 96 / Lotus Development Corp. / (800) 343-5414 / Price not available at press time / *Reader Service Number 656*

Contributors to Pulse: KYLA K. CARLSON, JAMES OLIVER CURY, MIKE HOGAN, RICH SCHWERIN, *and* JON ZILBER. *Edited by* WENDY TAYLOR.

PHOTOGRAPH BY ARNOLD TOSKE JD


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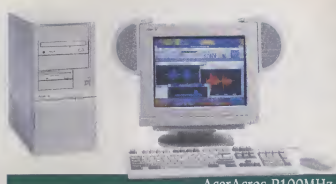
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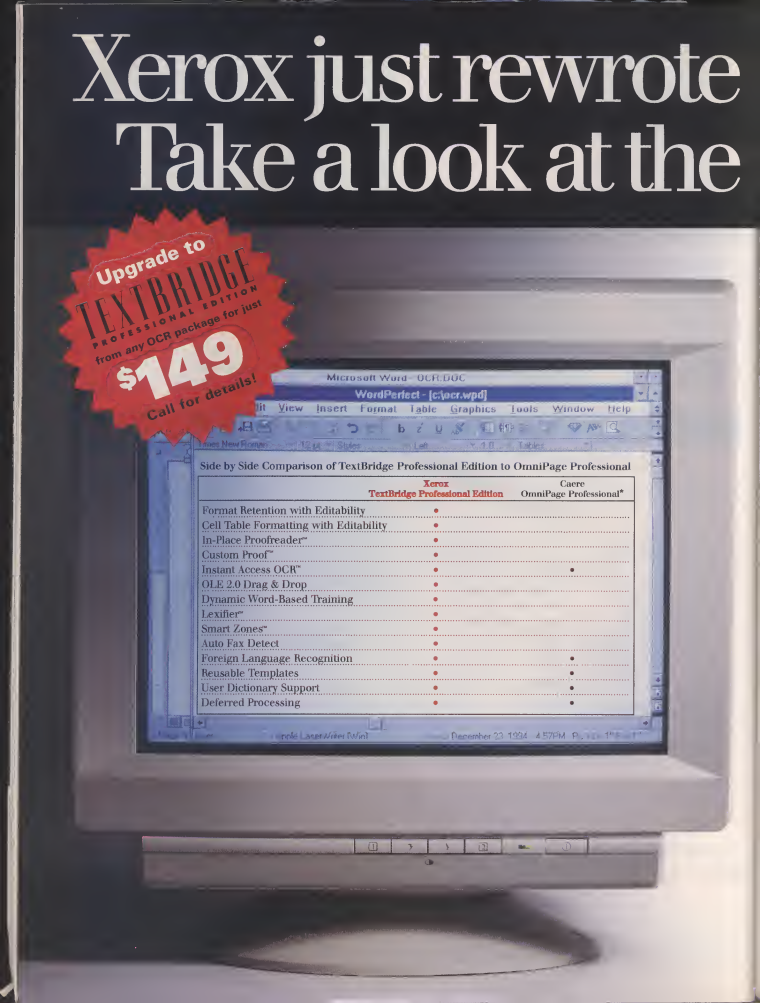
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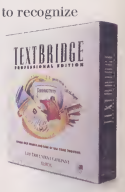
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The A-List

Editors' Top Picks by Wendy Taylor

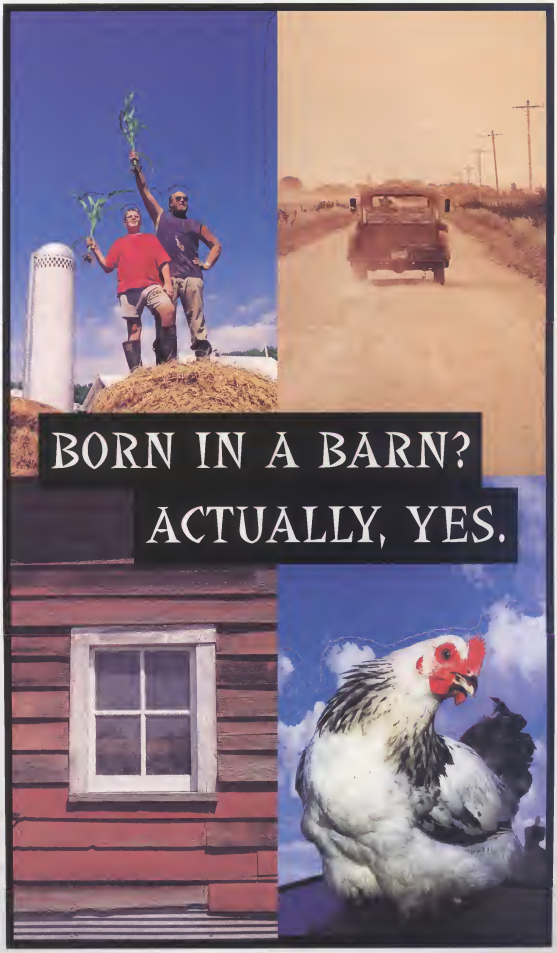
		Top Pick	The Buzz	The Stats *	Issue Reviewed
Systems	High-Performance Pentium	Micron Electronics P133 Millennia	Want to see Windows scream? Want to see it again?	$3,598, 133MHz Pentium, 16MB RAM, 1.2GB, 6X CD-ROM.	See September 1995, page 106. Reader Service No. 670
	Network Server	Digital Prioris HX 590	Our labs called it the fastest server to hit our test bench; we call it a great deal.	$17,900, 90MHz Pentium, 128MB RAM, 4X CD-ROM.	See this issue, page 126. Reader Service No. 671
	Pricewise Desktop PC	Dell Dimension XPS P120c	First-rate components at a cut-rate price—our favorite combo.	$3,599, 75MHz Pentium, 8MB RAM, 1GB, 4X CD-ROM.	See September 1995, page 106. Reader Service No. 672
Portables	Toshiba Satellite Pro T2150CDT	A built-in CD-ROM drive and batteries that last and last.	$3,799, 75MHz 486 DX4, 8MB RAM, 500MB hard drive.	See September 1995, page 513. Reader Service No. 673
	Dell Latitude XP 4100T	Tough as a linebacker, and batteries that work longer than you do.	$3,799, 100MHz Pentium, 8MB RAM, lithium-ion batteries.	See January 1995, page 124. Reader Service No. 674
Printers	Desktop Laser Printer	Hewlett-Packard LaserJet 5P	You can buy a faster laser, but not a better one. Plus, who needs cables? Beam jobs to the IR port instead.	$850, 6 ppm, 600 dpi, PCL 5 (PostScript optional), infrared port.	See June 1995, page 64. Reader Service No. 675
	Network Laser Printer	Hewlett-Packard LaserJet 4Si MX	Even 50-page print jobs fly out faster than you can trot down the hall to claim them.	$4,299, 17 ppm, 600 dpi, PCL 5, PostScript Level 2.	See December 1994, page 134. Reader Service No. 676
	Portable Printer	Citizen PN60	Slip it into your briefcase, then wow clients when you produce documents on the spot.	$365, 300-dpi thermal transfer, 2.25 pounds.	See February 1995, page 64 Reader Service No. 677
	Personal Color Printer	Canon BJC-70	If the sleek, black design doesn't grab your attention, the color output will.	$359, 720-by-360-dpi mono, 360-by-360-dpi color.	Stay tuned. Reader Service No. 678
Video	High-resolution Monitor	Nanao FlexScan T2-20	It's like buying orchestra seats for Windows—and worth every penny.	$1,380 (17-inch), $2,120 (20-inch), Plug and Play.	See July 1995, page 148. Reader Service No. 679
	High-resolution Graphics Accelerator	Matrox MGA Millennium	Ultrafast Windows RAM and 3-D acceleration make this the graphics accelerator to covet.	$480, 4MB WRAM, 1024 by 768 pixels at 76Hz, PCI interface.	See this issue, page 90. Reader Service No. 680
Storage	Removable Storage	Iomega Zip drive	Chic, purple, and portable. Plus, the cartridges are removable.	$200, 25MB or 100MB cartridges, SCSI or parallel.	See June 1995, page 70. Reader Service No. 681
	CD-ROM Drive	Plextor 6Plex	Faster access times than an L.A. on-ramp. Now where's our jukebox version?	$479, SCSI, 145ms random access time, 256K buffer.	See June 1995, page 67. Reader Service No. 682
Peripherals	Visioneer PaperPort	Moves paper off your desk and onto your hard drive. It's the quickest way to tame your paper in-box.	$369, 400-dpi scanner, document-management software.	See June 1995, page 68. Reader Service No. 683
	Creative Labs Sound Blaster Awe32	Ne plus ultra for business multimedia. And it's great for games, too.	$299, 32-voice polyphony, 16-bit DSP.	See June 1995, page 162. Reader Service No. 684
	U.S. Robotics Sportster Vi 28.8 DSVD	The next level in multitasking—send files and talk across a single phone line with the first DSVD modem.	$300, DSVD, V.34 (28.8Kbps), Intel's ProShare Premier Edition.	See September 1995, page 75. Reader Service No. 685

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The A-List Editors' Top Picks by Wendy Taylor

		Top Pick	The Buzz	The Stats *	Issue Reviewed
Desktop Applications	Software Suite	Microsoft Office for Windows 95	An excellent (and the only) software suite for Windows 95. Are you listening, Lotus and Novell?	$499 (Standard Edition), 28MB to 89MB hard disk space.	See September 1995, page 83. Reader Service No. 686
	Word Processor	Microsoft Word for Windows 95	The wordsmith's favorite app moves to Windows 95. Ami Pro fans: Stay tuned for a 32-bit Lotus Word Pro this fall.	$339, Windows 95 or Windows NT 3.51, 8MB RAM.	See September 1995, page 83 Reader Service No. 687
	Spreadsheet	Microsoft Excel for Windows 95	While Quattro Pro and Lotus 1-2-3 languish in the 16-bit world, Excel steals the 32-bit show.	$339, Windows 95 or Windows NT 3.51, 8MB RAM.	See September 1995, page 83. Reader Service No. 688
	Database	Lotus Approach 3.0	Microsoft's Access for Windows 95 is just around the corner—but Approach is still the usability champ.	$105, 386 CPU, 4MB RAM, 8.5MB hard disk space.	See March 1995, page 146. Reader Service No. 689
Graphics	Presentation Graphics	Lotus Freelance Graphics for Windows 95	Reason enough to upgrade to Windows 95. Great for flashy multimedia presentations.	$329 ($99 upgrade), Windows 95, 18MB to 40MB hard disk space.	See September 1995, page 94. Reader Service No. 690
	Personal Desktop Publisher	Microsoft Publisher 2.0	The people's press and the usability champ. We can't wait for the Windows 95 version.	$99, 386 CPU, 4MB RAM, 3MB hard disk space.	See July 1995, page 170. Reader Service No. 691
	Professional Desktop Publisher	QuarkXPress 3.3 for Windows	Produces pages as slick as the ones in your hands. PageMaker shops should check out PageMaker for Windows 95.	$570, 386 CPU, 8MB RAM, 12MB to 15MB hard disk space.	See December 1994, page 163. Reader Service No. 692
	Business Graphics	Visio 4.0	The drag-and-drop drawing program for left brainers gains do-it-for-me Wizards under Windows 95.	$149, 8MB RAM for Windows 95, or 4MB RAM for Windows 3.1.	Stay tuned. Reader Service No. 693
	Photo Editor	Adobe Photoshop 3.0 for Windows	A digital darkroom for your PC. But a Windows 95 version isn't expected until early next year.	$550, 486 CPU, 10MB RAM, 20MB hard disk space.	See November 1994, page 106. Reader Service No. 694
Finance	Personal Finance	Intuit Quicken Deluxe 4 for Windows	Branch-office checking from your hard drive.	$59, 386 CPU, 4MB RAM, 7MB hard disk space.	See April 1995, page 186. Reader Service No 695
	Business Accounting	Peachtree Accounting 3.0 for Windows	The least offensive CPA we've ever met.	$129, 386 CPU, 4MB RAM, 12MB hard disk space.	See October 1994, page 88. Reader Service No. 696
Communications	[illegible]	Delrina Communications Suite 2.1	Digital communications was never so easy; now available with a personal page scanner for sending hard copy.	$109 ($299 with page scanner), 486 CPU, 4MB RAM.	See January 1995, page 126. Reader Service No. 697
	[illegible]	Netscape Navigator	Still the best way to explore the Web. Download the new Windows 95 version from ftp.mcom.com.	$39, 4MB RAM, Windows 95, Internet access.	See April 1995, page 52. Reader Service No. 698
Organization Tools	Personal Information Manager	Lotus Organizer 2.0	So the interface is a little precious—the networking and usability extras are first-rate.	$119, 386 CPU, Windows 3.1, 8MB hard disk space.	See February 1995, page 118. Reader Service No 699
	Project Manager	Primavera Systems SureTrak Project Manager	Manage anything from aircraft design to next week's budget.	$450, 386 CPU, Windows 3.1, 4MB RAM, 11MB hard disk space.	See March 1995, page 80. Reader Service No. 700
	System Utility	Microsoft Plus for Windows 95	All the goodies Microsoft left out of Windows 95—Web browser included.	$50, 486 CPU, Windows 95, 25MB to 40MB hard disk space.	See September 1995, page 88. Reader Service No. 701
	Uninstaller Utility	Vertisoft Remove-It 2	Take back your hard drive: Sweep away disk-hogging Windows 3.1 apps, and clean up after Windows 95 installations.	$40, Windows 95 or Windows 3.1.	See this issue, page 44. Reader Service No. 702

*ESTIMATED STREET PRICE


BORN IN A BARN?
ACTUALLY, YES.



August 1985
"Hey, Mike ... call me crazy but I've had this craving all day to start a computer company!"
Ted Waitt

September 5, 1985
Congratulations, it's a computer company! Gateway 2000 is born at the Waitt Family Cattle Farm outside Sioux City, Iowa.





August 1985
Ted's grandma, "Momo," takes a leap of faith and becomes Gateway's first principal investor, securing a $10,000 loan.



April 2, 1986
The Livestock Exchang
at the Sioux City Stoc
Gateway's first home
home.

April 3, 1986
UPS man gets stuck in
tor for the first of mar
Begins thinking of sta
alternative.



1985 Annual Sales: $100,000 Employees: 2 *1986* Annual Sales: $1 million Employees: 4 *1987* Annual Sales:

November 1985
Ted springs for Thanksgiving dinner for entire Gateway workforce (Mike Hammond).

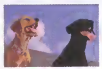




1986
North Sioux City, South Dakota, gets a water tower.



May 1986
Bunky & Jake fight a losing battle for company mascot honors. (The cow won.)



August 3, 1986
Shipping clerk covers for Ted over lunch and becomes Gateway's first sales rep.

1986
Gateway 2000 ships its first PC.

We will always be happy, but we will never be satisfied.

We share the vision of being our customers' only logical choice

1986
The Livestock Exchange Building cockroaches were this big.

Building
yards:
eway from

eleva-
times.
s as an

March 1988
Phone system expanded to 10 lines!

1988
Earle Grueskin, our first former Sioux City mayor, joins the payroll.

February 1988
25 systems built and shipped in one day! All 10 phones ringing off the hook from Gateway's first major ad in *Computer Shopper*, "Computers From Iowa?"



1989
It doesn't get any better than this — standard VGA monitors on all PCs!

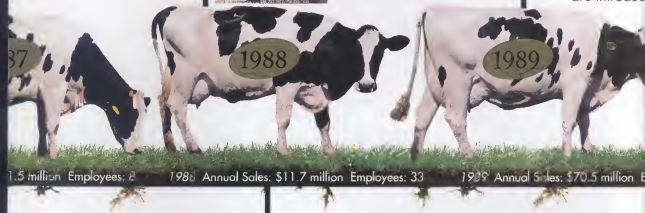
June 1989
Gateway goes online with GW2k BBS.

December 1989
McGraw-Hill purchases 386-20s and achieves immortality as Gateway's first major Fortune 500 customer

Industry First!

January 15,
Gateway mo
digs in North
SD. 185 emp
shipping 225

February 19
Ted thinks, "
of big — be
slogan." Ne
logo and "Y
friend in the
are introduc



1.5 million Employees: 8 | 1988 Annual Sales: $11.7 million Employees: 33 | 1989 Annual Sales: $70.5 million E

987
exas Instruments PC
ustomers exchange TI PCs
or Gateway 2000 IBM
ompatibles.

ebruary 1987
ed and Mike get sick
f looking at each
ther. Up go the first
ubicle walls!

987
hipping clerk/sales rep can't
ronounce "peripherals." So we
ocus on systems and ship our
rst 286 PC for $2,295.

Industry First!

1988
EGA color monitors standard on all systems.

1988
Ted hires high school kid (future Manufacturing Director) to spray paint Gateway logo on plain white boxes.

September 1988
Gateway herd finds greener pastures in Sergeant Bluff, Iowa (we moved there).

September 1988
Gateway sells 386-20 PC for $2,995, receives *Byte* magazine's Award of Distinction.

1990
The popu
Sioux Ci
whoppin

Octob
Gatew
system
value-p
$5,29

You've got a friend i



1991
Gateway becomes first company to win all four *Computer Shopper* Best Buy desktop awards.

February 1991
Gateway is first to introduce non-interlaced monitors on all systems.

Industry First!



April 1991
First cow-spotted boxes ship!

January 1991
Ted and Mike "Will you sell us about a gazillion processors?" Intel: "Umm . . No."

April 1991
Gateway debuts new cool gray case design: mini desktop model and standard AnyKey keyboard.

July 1992
Gateway's "Race" ad hits.



Industry First!

February 1992
Customers rejoice! Gateway begins offering choice of application software with new systems at no extra charge.

March 1992
Ted and Mike: will you sell us gazillion proce Intel. "Umm ...

1992
Barely seven years old and already Micros PC Manufactur of the Year.

90
to new
ioux City,
yees are
Cs per day.

etting kind
r think of a
Gateway
've got a
usiness"



ployees: 176 1990 Annual Sales: $275.5 million Employees: 600 1991 Annual Sales: $626.7 million Employees: 1,300

ition of North
reaches a
2,019

1990
's first 486
its the market
ced at

Industry First!

May 1990
Microsoft Windows is now standard on all Gateway systems.



the business.

April 1991
Technical support completes a record number 2,800 calls in one day!

July 1992
Gateway pours first paved parking lot. Employees throw away hip waders.

1991
Inc. magazine proclaims Gateway the fastest-growing company in the nation.



August 1991
Gateway's Robin Hood I ad hits.

March 1992
Technical support holding queue is empty for the first time in company history.

Indus
Firs

May 1992
Going mobile with
portable computers,
ing the HandBook,
industry's first subno

N
A
Th

The best place to buy a PC on the planet!



April 1993
Gateway named a Fortune 500 company and North Sioux City gets its *first* 4-way stop sign.

1992
nd Mike: "Now
ou sell us about a
ion processors?"
"Umm ... OK."



seven
old and
y Microsoft
nufacturer
Year.

1993
Gateway offers first Family PC multimedia system for $1,995.

March 1993
Gateway hires its 2000th employee.

April 1993
Gateway's one millionth PC ships to Jerry Herak in Spokane, Washington.

May 1993
Cow spots painted on Gateway's North Sioux City facility. Employees wonder what's next.

Industry First!

August 1993
The ColorBook and HandBook 486 enter Gateway's stellar product lineup.

May 1994
Gateway announc
three-year warran
desktop PCs and n

July 1, 1994
Gateway opens a showroom in Paris, France.

July 1994
CD-ROM drives s
on all Gateway sy

September 1994
OK, now it's Irela
and Germany. Te
foreign language



yees: 1,300 1992 Annual Sales: $1.1 billion Employees: 1,850 1993 Annual Sales: $1.7 billion Employees

2
pport
eue is
e first
pany

Industry First!

ile with our first
mputers, includ-
ndBook, the
rst subnotebook.

October 1993
Gateway Europe sets up shop in Dublin, Ireland, marketing to Ireland and the UK.

1993
Gateway hires second former Sioux City mayor, Jim Wharton.

December 1993
Gateway becomes a public company.

November 1993
Another Gateway facility opens! This time in Sioux Falls, SD.



September 1993
Gateway introduces first VESA system.

Industry First!

October 1993
Gateway offers our first Pentium system, the P5-60, for $3,595 and sweeps *Computer Shopper's* Best Buy awards for third consecutive year.

October 1994
North Sioux City welcomes the first "golden arches" of McDonalds.

November 1994
New Gateway facility opens in Kansas City.





Decembe
The Liber
notebook
its debut.

Decembe
Gateway
"Feel Like

Industry First!

nces a
anty for all
d monitors.



March 1995
Premier issue of *GW2k: Gateway Magazine.*

May 1995
Gateway's P5-120 is named the "fastest PC in the world," by *PC/Computing.*



May 1995
Technical support completes 12,046 calls in one day! All techs treated to sparkling cider in plastic champagne glasses.

July 1995
Gateway ranks first among Intel/Windows PC manufacturers in brand loyalty.

September 5, 1995
6,000 employees worldwide celebrate Gateway's 10th Anniversary

September 6, 1995
Expansion must be our middle name! Plans announced for Gateway Japan.

standard
systems

4
land, France
Ted considers
ge lessons.



GATEWAY 2000
"You've got a friend in the business."®

es: 3,500 *1994* Annual Sales: $2.7 billion Employees: 4,500

Industry First!

June 16, 1995
Gateway is first to offer Windows 95 as a free upgrade on all standard configurations.

1996
North Sioux City gets its first traffic lights.

July 28, 1995
Gateway goes "down under" to Australia.

August 1, 1995
Gateway Gold service and support program unveiled.

2015
Gateway continues its dedication to bringing all PC buyers the highest performance, technology and service — all at the best value.

ber 1994
erty small
ok makes
ut.

ber 1994
ay's Holiday ad insert,
ke A Kid Again" hits.

2020
"Hey Mike ... call me crazy, but I think this whole computer company idea is gonna fly."
Ted Waitt

We've always known our customers are the best. And now we have proof that Gateway 2000® has the most loyal customers in the entire Windows®-based PC industry!

Loyalty Unmatched

They've shown their allegiance by ranking us number one in brand loyalty in a new study from Computer Intelligence InfoCorp (CII). Among Windows PC manufacturers, Gateway 2000 ranked first in brand loyalty with an overall repurchase rate of 82%, 18 percentage points more than the nearest competitor! CII's annual Consumer Technology Index study is the largest, most comprehensive survey of PC usage in the U.S.

Why Gateway?

In 10 short years, Gateway 2000 has nurtured this customer loyalty by always keeping customer service and support our top priority. *And* by leading the industry in value and technology. We work hard to bring the right product to our customers at the best prices along with performance unmatched by the competition.

Industry Firsts

Gateway 2000 has consistently brought PC buyers the very lastest technology *before* the competition. Check out our timeline to see all Gateway's incredible industry firsts!

Unparalleled Service & Support

Our toll-free technical support representatives are fully trained to handle all your technical questions. Gateway's dedication to our customer doesn't end with the sale. We've vowed to keep our customers the happiest PC users in the world. And now all Gateway 2000 PCs come standard with Gateway Gold™!

Gateway Gold Service & Support



Gateway Gold Service and Support

This new service and support program gives you all the support you need *when* you need it.

GATEWAY GOLD

- Toll-Free Technical Support 24 Hours A Day, 7 Days A Week
- Free Software Technical Support for all Gateway-provided operating systems & applications (Includes Windows 95 Support)
- Industry-Leading Response Times For Toll-Free Support
- One-Year On-Site Service Agreement*
- Next Business Day Response On-Site Service†
- Scheduled On-Site Service (2-hour appointment window)
- Extended On-Site Service Hours (6am-10pm Monday-Friday, 8am-5pm Saturdays)
- Three-Year Limited Parts Warranty*
- Express Replacement Parts Delivery
- Club Gateway™ Membership
- *GW2K™: Gateway Magazine* — Gateway's quarterly publication
- Gateway Bulletin Board (BBS) Service
- Automated FaxBack Service

Be sure to ask about Gateway Gold Premium and À La Carte programs!

† Pending Parts Delivery
**Call or write us for a free copy of our on-site service agreement or three-year limited parts warranty.*

GATEWAY2000
"You've got a friend in the business."®

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intel inside
pentium PROCESSOR

At Gateway 2000, we always keep our sights on your future,

giving you the latest computer technology. To take full advantage of Microsoft® Windows® 95, you'll need a PC specifically designed for this new operating system. So, we gave it our all and built every Gateway 2000® PC to optimally run Windows 95. Continuing a tradition of industry firsts, Gateway announces new keyboards, designed with Windows 95 in mind, and 100% Windows Plug and Play compatibility on all Gateway systems! Plus, every professional desktop also includes the new MS Office 95, Professional Edition software suite.

New Gateway 104+ Keyboard!

It's another industry first! All Gateway desktop PCs include the new AnyKey®* or 104+ keyboard designed for your Windows 95 operating system. These keyboards include three new keys to work with Windows 95 — so you can easily switch between applications, launch programs and access files, and use shortcuts for the right-mouse button. As an added bonus, MS IntelliPoint and IntelliType software turns your mouse and keyboard into powerful, personalized computing tools. You'll love how the new AnyKey+ and 104+ keyboards and MS software complement the Windows 95 operating system.

Microsoft Windows 95

All Gateway 2000 PCs include Microsoft Windows 95 and are optimized to take full advantage of this new operating system. A 32-bit multitasking architecture gives you stellar performance, and a new graphic interface makes using your new operating system a breeze. You'll also be prepared for tomorrow's technology advances with Windows 95's 32-bit platform.

Gateway 2000 also provides Windows 95 toll-free technical support including installation, configuration and problem resolution assistance for the life of your computer!

Optimized for Windows 95!



New Microsoft Office 95, Professional Edition

Another industry first. Microsoft Office 95, Professional Edition is standard on all Gateway professional desktop systems. This software suite includes the latest 32-bit versions of MS Word, Excel, PowerPoint® presentation graphics program and Schedule+, all on CD. Plus, you'll receive MS Access® database and Bookshelf® '95 on CD upon release from Microsoft later this year ($10 shipping charge). Specifically designed to take advantage of the powerful 32-bit Windows 95 operating system, Office 95 is loaded with great new enhancements. The Office Shortcut Bar gives you one-click access to all five office applications, and Office Binder lets you keep documents from all applications in one place. Office 95 upgrades are available through Gateway's Component Add-On Sales for all Gateway customers with any version of MS Office or MS Works — for just $299.

Call Gateway 2000 today and get Windows 95 optimized!

100% Plug and Play Compatible!

That's right. Gateway 2000 is the first company with 100% Windows Plug and Play compatibility across the line. Every Gateway PC is now optimized with Plug and Play BIOS, peripherals, and operating system. Configuring and expanding your system is now easier than ever, because Plug and Play automatically recognizes and configures any new expansion hardware installed in your PC. Plug and Play will keep your computer up to speed as your needs change and technology increases.

Designed for Microsoft Windows 95

GATEWAY2000

"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 2

intel inside pentium PROCESSOR

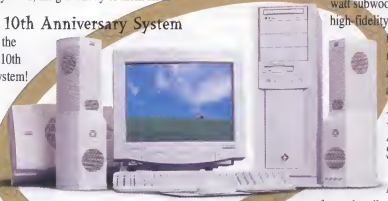
The 10th Anniversary System

It started as a dream, born on an Iowa farm. Today, 10 years later, the same company that once clocked in by a rooster crow is recognized as the nation's PC industry leader. The Gateway 2000® secret? Give PC buyers a quality product, the latest technology, and incomparable service — all at an unparalleled value. Our hard-working employees know what it takes to get the job done right. And we're ready to outdo ourselves in the next decade and beyond.

In an industry where change is the only constant, Gateway 2000 is proud of our loyal customers. How are we thanking them for 10 years of success? We asked our neighborhood Hallmark store, and they said, "10th anniversary gift? Why, traditionally that's tin!" So, we threw that around for awhile, then worked with our suppliers to bring you an incredible price on an extra-special, limited quantity computer: the system of systems, the grandaddy of them all ...

Gateway's 10th Anniversary System

Introducing the Gateway 2000 10th Anniversary System! It's everything Gateway is famous for: industry-leading product introductions, ultimate performance and incomparable value! Designed with the computer connoisseur in mind, this limited edition, standard configuration comes in new tower case sporting our 10th Anniversary insignia and houses a 133MHz Intel® Pentium® processor, 16MB EDO memory, and 17-inch Vivitron™ color monitor. As well as *these* industry firsts!



6X EIDE CD-ROM Drive

That's right! Gateway 2000 is the *first* to announce the new blazing 6X CD-ROM drive, standard on our 10th Anniversary System. It's the fastest EIDE CD-ROM *anywhere*. Combined with a Matrox® MGA WRAM graphics accelerator, you get 3-D graphics, smooth full-motion video, and you're primed for video scaling applications including MPEG and video conferencing.

New AnyKey+ Keyboard

Another industry first, the Anniversary System includes our programmable AnyKey+ keyboard for complete functionality with the Windows 95 operating system. It includes three keys specifically designed to take advantage of Windows 95 features.

Gateway Exclusive Sound System!

Our 10th Anniversary System includes *the first* speaker system designed to create theater-type surround sound for the multimedia computer environment! Two Altec™ Lansing Surround Sound 1.5-foot tower satellite speakers and a 40-watt subwoofer give you high-fidelity stereo sound for all your multimedia applications and music CDs.

10th Anniversary Software

The Anniversary software bundle includes Microsoft Office 95, Professional Edition and Gateway's Generations Collection for over 56 of the most popular software applications. You won't find a more complete software package anywhere else!

Celebrate a decade of incredible PC values and order your Gateway 2000 10th Anniversary System today! Order *any* Gateway system and enjoy our commemorative 10th Anniversary mouse pad!

Designed for Microsoft Windows 95

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intel inside
pentium PROCESSOR

Gateway 2000® Family PC™ Systems

P5-75 FAMILY PC

- Intel® 75MHz Pentium® Processor
- 8MB RAM
- 540MB 11ms EIDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec™ ACS-5 Speakers
- TelePath® 14.4 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" .28dp CrystalScan® Monitor
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **Microsoft® Windows® 95**
- Generations Software Collection
- **Gateway Gold™ Service & Support**

$1899

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor
- 8MB EDO Performance-Enhanced Memory
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- **TelePath 28.8 Fax/Modem Communication Center**
- 3.5" Diskette Drive
- **15" .26dp Vivitron™ Color Monitor**
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- Generations Software Collection
- **Gateway Gold Service & Support**

$2399

P5-120 FAMILY PC

- Intel 120MHz Pentium Processor
- 8MB EDO Performance-Enhanced Memory
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- **TelePath 28.8 Fax/Modem Communication Center**
- 3.5" Diskette Drive
- **17" .26dp Vivitron Color Monitor**
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- Generations Software Collection
- **Gateway Gold Service & Support**

$2999

Generations SOFTWARE COLLECTION

- Microsoft® Encarta®'95 • MS Bob™ • MS Money 3.0 • MS Works 3.0 • MS Publisher 2.0 • MS Publisher Design Pack • MS Cinematic®'95 • MS Bookshelf® '95 • MS Composer Collection: Beethoven, Mozart and Schubert • MS Wine • MS Arcade: Missile Command,™ Asteroids, Tempest™ Centipede® and Battlezone™ • MS Dinosaurs • Mayo Clinic® Family Health Book • and Mayo Clinic Family Pharmacist • plus 31 popular MS entertainment games.

All Gateway 2000 systems are ISO 9002 Certified for quality assurance.

ISO 9002

Professional Systems

P5-75

- Intel 75MHz Pentium Processor
- 8MB RAM
- 540MB 11ms EIDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- 14" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- MS Works 95
- **Gateway Gold Service & Support**

$1599

P5-100

- Intel 100MHz Pentium Processor
- 8MB EDO Performance-Enhanced Memory
- 730MB 10ms EIDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- 15" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition* with Bookshelf '95**
- **Gateway Gold Service & Support**

P5-100 $1999
P5-90 $1899

P5-120

- Intel 120MHz Pentium Processor
- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- 15" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition* with Bookshelf '95**
- **Gateway Gold Service & Support**

$2699

P5-133

- Intel 133MHz Pentium Processor
- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1GB 9ms Mode 4 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM Drive
- 3.5" Diskette Drive
- **15" .26dp Vivitron Color Monitor**
- 9-Bay Tower Case
- **New 104® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition* with Bookshelf '95**
- **Gateway Gold Service & Support**

$2999

10th ANNIVERSARY SYSTEM

- Intel 133MHz Pentium Processor
- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1.62GB 9ms EIDE Mode 4 Hard Drive**
- PCI Enhanced IDE Interface
- **Matrox® MGA™ Millennium™ 2MB WRAM Graphics Accelerator**
- **6X EIDE CD-ROM Drive**
- 16-Bit Ensoniq® Wavetable Sound Card & **Altec™ Lansing Surround Sound Speakers w/ Subwoofer**
- **TelePath 28.8 Fax/Modem Communication Center**
- 3.5" Diskette Drive
- **17" .26dp Vivitron Color Monitor**
- 9-Bay Tower Case
- **New AnyKey® Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **10th Anniversary System Software Collection: MS Office 95, Professional Edition* with Bookshelf '95 and Generations.**
- **Gateway Gold Premium Service**

$3999

*MS Office 95, Professional Edition includes MS Word, Excel, PowerPoint® presentation graphics program, and Access® database ($10 shipping charge).

GATEWAY GOLD™ SERVICE & SUPPORT

Service When You Need It

- Toll-Free Technical Support 24 Hours A Day, 7 Days A Week
- Free Software Technical Support for all Gateway-provided operating systems & applications (includes Windows 95 Support)
- Industry-Leading Response Times For Toll-Free Support
- 1-Year On-Site Service Agreement
- Next Business Day Response On-Site Service†
- Extended On-Site Service Hours (6am-10pm Monday-Friday, 8am-5pm Saturdays)
- Scheduled On-Site Service (2-hour appointment window)
- 3-Year Limited Parts Warranty
- Express Replacement Parts Delivery
- Club Gateway™ Membership
- *GW2k™: Gateway Magazine*
- Gateway Bulletin Board (BBS) Service
- Automated FaxBack Service

†Pending parts delivery.

Toll free from Canada 800-846-3609

Toll free from Puerto Rico 800-846-3613

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GSA Schedule # GS-00K-94-AGS-5150-PS01

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All Pentium PCs feature the ultra-fast Triton chip set and Plug and Play BIOS.

intel inside

pentium PROCESSOR

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526 International FaxBack Access 605-232-2561 • Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

Industry-leading values from Gateway 2000.® Peripherals and software sold only with the purchase of a system.

New Service & Support

Gateway Gold Premium

- Extended Three-Year On-Site Agreement
- Priority 800 Number For Access To Technical Experts **$99**

Gateway Gold Á La Carte

- On-Site System Installation
- On-Site Upgrade/Add-On Installation
- Hardware and Software Customization/Integration

Ask your sales rep for details and pricing information.

Communications & Storage

TelePath® 28.8 Fax/Modem Communication Center

Internal fax/modem, 28,800bps modem, V.34, with 28,800bps fax capability. Sends and receives data and faxes, and also includes full voice mail capabilities. Includes trial memberships to CompuServe®, AOL and Prodigy®. **$149** *(TelePath 14.4 Fax/Modem $79)*

Colorado Memory Systems® Jumbo™ 1400 TBU

CMS Jumbo 1400 internal tape backup unit with up to 1.36GB compressed (680MB native) storage capacity per tape. Comes with MS Windows®and DOS® software, one tape and cable. **$199**

Multimedia

4X Three-CD Changer

Enhance the value and usefulness of your PC with the 4X three-CD changer. It supports multisession photo CDs and XA format, enabling simultaneous audio and data with additional hardware. You'll have access to three times the amount of information of a regular CD-ROM drive. **$125** *(upgrade from 4X CD-ROM)*

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq® Soundscape™ 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster™, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
- New Altec™ Lansing ACS-31 three-piece speaker system
- Blue Ribbon Sound Works' SuperJAM! jr. software

$209 *(with system purchase)*
$110 *(upgrade from systems with 16-bit sound card and Altec speakers)*

Networking

3Com® Ethernet Adapters

High-performance 16-bit Ethernet cards.
16-bit Triple Media Card with BNC, AUI and RJ-45 connectors **$109**
16-bit Card with only RJ-45 connector **$89**

SMC® PCI Ethernet Adapter

32-bit card with both RJ-45 and BNC connectors **$139**



Ask About Our "90 Days No Payment" Program!

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.



Monitors

Gateway Vivitron™ Color Monitors

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution.

Gateway 15-Inch Vivitron Color Monitor, .26 dot pitch
Upgrade from a 14" CrystalScan® to 15" Vivitron monitor **$140**
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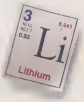
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The Internet's 30 million users currently churn out a terabyte of data every day—the equivalent of 70 million 300-page books per month.

And this is just **SPIT IN THE OCEAN,** compared with the forthcoming information overload expected when CompuServe, America Online, Prodigy, and an army of direct I-Way providers battle it out for new recruits before the Microsoft Network colossus dumps 30 million more users onto the already overburdened lines.

One analyst, Volpe Welty's Gregory Curhan, predicts there will be over **HALF A BILLION** Internet users by the end of the decade. All trying to get onto the Playboy home page at the same time.

In addition, all this data is becoming vastly more complex. While in past years most traffic consisted of efficient, point-to-point "unicast" text, the **HOT NEW BYWORDS** are *multimedia* and *multicast.* Which can really gum up the works.

Why settle for typing when you can video-conference face-to-face? Who wants text when there are so many real-time film clips, animations, 3-D sites, and hi-res GIF images? How about those cool new simulated long-distance phone calls? Or **BANDWIDTH BUSTERS** like live rock concerts sent to thousands of users at once? (Get ready for the Internet's glitzy "MBone" multicast backbone, which promises radio- or TV-like broadcasts with their voracious line-choking needs.)

Plus, the millions of I-Way newbies will prefer the graphics-intensive Web instead of the more efficient, text-based Internet. How you gonna keep 'em down on the ASCII farm once they've surfed the Louvre site in Paree?

Worse, the original Internet backers are now backing away. First, Uncle Sugar is **BUTTONING UP HIS WALLET.** The government used to foot much of the I-Way operating bill but has been pulling out since 1993. Downloading bitmaps from Bulgaria for free is great, but who do you think has been paying the freight all these years?

And the universities that once contributed heavily are bailing too. Why should they drag data over a slow, clogged, 45Mbps Internet wire when they can now blast bits across new, exclusive vBNS (very–high-speed Backbone Network Service) lines at the rate of 155Mbps, 4 times that next year, and 16 times that speed in 1998? The National Science Foundation has **YANKED ITS SUPPORT** for the old Internet infrastructure and is pouring resources into vBNS.

Just wait. Soon you'll be slogging through Manhattan-style gridlock I-Way traffic and paying through the nose while the in crowd flies fast and free. Enjoy it while you can.

PHOTOGRAPH BY JAMES McGOON

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John C. Dvorak



Future Stock

Yikes! The 21st century is a few years off, but the issues we'll be wrestling with when the millennium rolls around are already apparent. Let's look at the trends in the major categories of software—database management, telecommunications, word processing, spreadsheets, graphics, networking, and games—to see where they're headed.

Database Management Anybody with half an eye on Wall Street can tell you what lies ahead here: Lotus Notes. With IBM buying Lotus for 3 billion bucks, Notes is now safely ensconced as the de facto model for the database scene of the next decade. Like it or not, the client-server database management system that constitutes the core of Notes will be the model for all major database activity in the future. Everything wrong with Notes—the horrid interface and the slow replication times, for starters—will be corrected by add-on products and faster networks. Eventually.

Telecommunications Want to lose your shirt? Bet against the Internet. Whether it's the phone company's integrated services digital network (ISDN) leading to asynchronous transfer mode (ATM) or the cable company's modems hooked to the computer, someone will furnish a faster pipe to your PC and make a bundle. And because its architecture ensures that it cannot be easily controlled by the government, it will become the primary source of information for Joe Couchpotato. The printed newspaper and magazine will be forced to find new roles, as radio did when TV took over as the primary source of entertainment.

Word Processing Yawn. Word processing has become moribund, with most innovative ideas already explored and implemented. What will Microsoft Word version 15 do that version 6 didn't do? Adding video clips and voice is already old hat. Adding outstanding voice and handwriting recognition is all that's left to do.

Spreadsheets Ironic. It was spreadsheets that got the industry off to a fast start—first VisiCalc, then Lotus 1-2-3. This is the category that first got Joe Beancounter interested in computers. But since Microsoft Excel and the graphical spreadsheet, there has been nothing new under the sun. It's a well-defined and mature category, just like word processing. There's a little room to make these tools more accessible for the home user, but nothing too exciting here.

Graphics Only recently have PCs done for artists what they did for writers back in the 1970s. Joe Photoshop can now outproduce a hand-drawing competitor by a wide margin. These tools will eventually become so powerful that you'll be able to re-create and manipulate a completely lifelike digital image of an actual person in real time so convincingly that actors may become obsolete. The graphics and artist community will chew up more computer power than almost any other group, and will fuel the need for faster and cheaper CPUs, storage, and memory.

Networking The name of the game here is higher speeds and better usability. The company that can make networking fun will win all the marbles. In fact, networking is the real target of Microsoft and Windows NT. The company is so preoccupied with being the standard in this area that it named its online service Microsoft *Network*. Still, there is little new technology here, and the networking endgame will be played out as a marketing exercise between Microsoft and Novell.

Games Multimedia, virtual reality, CD-ROMs. These will all dominate our spare time in the next decade as the game arena continues to be one of the most exciting categories. The programs are the result of intense creative effort and will never become commodities. Joe Joystick's appetite for newer multidisc games will force the CD-ROM standard to move to higher capacities. And network-savvy games will drive networking to become more usable. One factor that's keeping this market segment interesting: None of the megacompanies—Microsoft, IBM/Lotus, Novell/WordPerfect—owns it. Yet.

Recap Networks will aim to become more gamelike. Games will become more networked. Business apps will target the home. Home apps will target business.

By the year 2000, Microsoft will still be the king of SOYBEAN SOFTWARE, but the high-stakes action will be in GAMES and VIDEO arts. And get ready for a SURPRISE or two.

How will the major players stay busy? Lotus Notes is a pure business product, perfect for IBM—a company that has never liked dealing with the public. Microsoft will own all the categories in which products have become commodities. It will try to keep profits steady by creating new products from old ones—as it did in the case of Microsoft Office. But once these products sell for prices that reflect their commodity-like nature, Microsoft's role will be reduced to the king of soybean software. Which is why the company is so anxious to make its mark on the more interesting—and more profitable—markets like the Internet, and to wrest control of networking from Novell.

And there's room for one more high-stakes player to own the most explosive arenas: games and video arts. Anybody know Michael Eisner's beeper number?

PHOTOGRAPH BY JAMES McGOON

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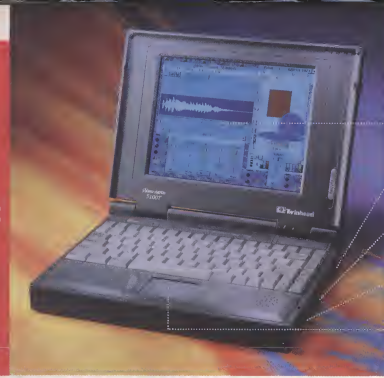
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PC Computing, August, 1995

PCComputing

★★★★1/2

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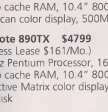
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New! Portégé 610CT

Perfectly Portable Pentium

The folks at Toshiba America who sent us the superportable Portégé 610CT for this review mistakenly believe that we plan to return it. Ha! Not without a fight. Sorry Toshiba, it's ours now.

This machine goes wherever we go because it's the most portable powerhouse on the market. Over the past four years, notebook makers have toiled arduously to make their machines double as desktop replacements. But bells and whistles take their toll. Today, a notebook's average traveling weight has crept up to a shoulder-cleaving 7.5 pounds or more. The Portégé 610CT weighs a slight 4.8 pounds.

Less and More Yes, it's svelte, but you're probably thinking the Portégé 610CT is underpowered, right? Think again: This updated 610CT comes with a 90MHz Pentium. (What's the CPU in the seven pounder you currently lug back and forth across the country?)

As you'd expect, this subnote's performance sings. In our Windows application benchmark tests, Toshiba's Portégé 610CT ran a flat 25 percent faster than NEC's 75MHz Pentium-equipped Versa P (which weighs 7 pounds). It ran 10 percent faster than ARM's similarly equipped 90MHz Pentium notebook (which weighs a hefty 8 pounds). Ouch.

Let's put that another way: With 8MB of RAM, the Portégé is faster than any portable we've seen. With this upgrade, the Portégé's CPU charge consumption drops from the industry-standard 3.3 volts to 2.9 volts when the chip is idle. Not only does this conserve battery life, it also helps keep the processor cool, even within the coach-class confines of the machine's chassis. Unlike most Pentium notebooks, the Portégé didn't warm our laps—even after more than two hours of work.

Can It Dance? Still looking for compromises? So are we. New to the 610CT is a 9.5-inch thin film transistor (TFT) color display—a full square inch larger than the display on the original Portégé. Although not as large as the 10.4-inch LCD on IBM's ThinkPad 701C (a.k.a. the Butterfly), it's pleasingly bright. Hues are richly saturated. Frankly, screen response for multimedia presentations is better than that of most desktop CRTs. For audiences of up to three, you won't need to hook up an additional monitor. (Although the machine supports 256 colors at 1,024 by 768 resolution on an external monitor, you get only 256 colors at standard VGA resolution on the LCD.)

But can the Portégé double as a presentation machine? It's less of a stretch than you might think, thanks to its 16-bit Sound Blaster–compatible audio, which features MIDI and WAV synthesis support. There's a full complement of jacks, as well as an integrated microphone. You'll want to tote along your own speakers, though; the Portégé has only one, and its tin-can quality will distract from your visuals.

Toshiba bumped up the machine's hard drive capacity to a generous 685MB—good enough for any business application and big, splashy multimedia presentations. Forgive our harping, but we still wish the drive were removable, as it is in IBM's Butterfly. The standard 8MB of high-speed EDO RAM is expandable to 40MB, but be prepared to pay through the wazoo for extra memory. An 8MB upgrade, which we consider mandatory

OVERVIEW Pentium Power, 4.8 Pounds



What Trade-offs? Now outfitted with a bigger active-matrix display and a 90MHz Pentium CPU, Toshiba's 4.8-pound Portégé 610CT steps ahead of the competition—again.



Touch Type: Toshiba makes the best undersize keyboards you'll find; the spacing on the QWERTY keys is barely compromised. Other advantages include the integrated pointing stick and ample wrist rest.

Guide to PC Computing's Ratings

Excellent *A market leader that offers exceptional performance* ..... ★★★★★
Good *Excels in many areas; a good buy* ..... ★★★★
Acceptable *Average for its class; a justifiable purchase* ..... ★★★
Poor *Out-of-date or substandard; offset by some positive features* ..... ★★
Unacceptable *Missing necessary features; avoid* ..... ★

for running Windows 95, costs $679, 16MB will set you back $1,249, and 32MB can be yours for a mere $2,549.

No Labels, Please With Pentium power and a top-drawer set of features, is the Portégé truly a subnotebook? Call it what you like: Its 7.9-by-9.9-by-2-inch dimensions shave more than 20 percent off a traditional notebook's footprint—a subtle savings you'll appreciate over time.

The machine tucks snugly into a briefcase pocket, shares table space with a printed handout (or lunch), and drops unobtrusively into the seat pocket in front of you during takeoffs and landings. Try doing that with a typical seven-pound portable.

As for usability, the Portégé's diminutive size forces some difficult trade-offs. The keyboard is 90 percent of the size of a standard notebook. This has spelled doom for other subnote offerings, including well-wrought models from Compaq (the Contura Aero) and IBM (the 500 series). While fat fingers stumble and grope, companies are leery about adding wee machines to their notebook pools. Instead, they've opted for full-size, lightweight offerings like Digital Equipment Corp.'s elegant HiNote series.

That said, Toshiba has unquestionably designed the best undersized keyboard you'll find. QWERTY keys sacrifice little spacing. Half-size function keys line up in a row along the top (you'll have to peek). There are even tiny Page Up, Page Down, Home, and End keys in a column on the right (Home elbows into the backspace key, however, which is irksome). Fingers move deftly to Shift, Tab, and Enter keys.

You'll have no problem finding cursor controls. In fact, adapting to the Toshiba keyboard requires far less time than you'd imagine. Credit the generous wrist rest, which is quickly becoming an industry standard. With hands relaxed while poised over the keyboard, fingers stab gingerly at keys without forcing your wrist (and your entire arm) to wrench and cramp.

Butterfly or Portégé? The alternative, of course, is a full-size keyboard like that on IBM's Butterfly, which physically unfolds when you raise the lid. The Butterfly is slightly smaller and weighs marginally less than the Portégé, but it provides no wrist rest. Will you prefer the Butterfly's keyboard to the Portégé's? Not necessarily; personal typing habits and finger size will dictate. Whichever layout and size you favor, both keyboards are setting the standards by which all sub–five-pound portables will be judged.

Ditto for other usability niceties. Both portables feature AC adapters no bigger than a large bar of soap. There are dual PC Card slots for expandability. The Portégé's rear-port cover pops open, then tucks inside the machine so that it won't break. Both also use lithium-ion batteries, which offer more charge for the weight than other battery types, including nickel-metal hydride.

So which machine has the edge? The Butterfly's larger display, full-size keyboard, and smaller dimensions give it the leg up in usability. But for raw, no-apologies Pentium power in a lightweight package and a battery that goes and goes, Toshiba's 4.8-pound Portégé 610CT dusts any other portable you'll find. MARTY JEROME

FILEBOX

Portégé 610CT

Usability ★★★★½
Technology ★★★★★
Verdict ★★★★½
Portégé 610CT or Butterfly? Your fingers will decide.

Competition: IBM's ThinkPad 701C (Butterfly) notebook offers some extras such as a larger keyboard and display, but the Portégé 610CT is faster. The differences between the two are minimal and will boil down to personal preference.

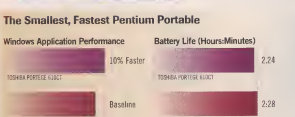
Configuration Tested: 90MHz Pentium processor, 8MB of RAM, 685MB hard drive, and integrated audio.

Expansion Options: Two Type II and one Type III PC Card slots, up to 40MB of RAM ($679 for 8MB module, $1,249 for 16MB, $2,549 for 32MB).

$4,649 est. street price
Toshiba America Information Systems
(800) 334-3445
Reader Service No. 601



An Extra Inch: The Portégé 610CT's bright 9.5-inch thin film transistor display is a full square inch larger than the screen on the original Portégé.



PHOTOGRAPHS BY ARNOLDO TIOSEJO

Stand Back: Toshiba's Portégé 610CT outpaced ARM's Pentium—previously the fastest portable. A Pentium model of IBM's comparable ThinkPad 701C isn't available yet.

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Color LaserWriter 12/600 PS

High-Impact Color for the Whole Office

A new face is emerging in the color-laser arena. But before overlooking Apple's Color LaserWriter 12/600 PS because you're a Windows user, consider that this Apple isn't just for Macintoshes. Out of the box, it's ready to print from Windows 3.1 and Windows 95 in stunning 600-dpi color. Even better, the Color LaserWriter 12/600 PS handles network printing in a mixed environment, which keeps those Windows and Mac users working together peacefully.

More for the Money At first glance, the Color LaserWriter 12/600 PS's price tag appears higher than those of some competitors. But if you stop and consider what you're getting for the money, it's quite a good deal. At $6,550, the LaserWriter 12/600 PS offers 12MB of RAM, 600-dpi output, and Ethernet and AppleTalk support.

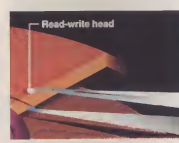
Setup is quick and easy, and driver installation is straightforward. The included software gives you a high level of control over your color print jobs. One quibble: We'd like to see more online graphics and document controls.

BIOS Snag We experienced one compatibility problem with the Color LaserWriter 12/600 PS: If you're running a 486 or Pentium-based system with a Phoenix BIOS, you may have trouble getting the LaserWriter to print. The fix is simple—just edit a paragraph in Windows 3.1's SYS.INI file (contact Apple for exact details). If you're using version 1.1 of the driver or later (1.1 is scheduled for release soon), you shouldn't experience any problems.



Shades of Laser: Apple's Color LaserWriter 12/600 PS sets new standards for output quality and affordability. It ships with 12MB of RAM, 600-dpi resolution, and Ethernet and AppleTalk support.

Pleasing Palettes: White text on a dark background is no problem for the Color LaserWriter 12/600 PS. Colors are sharp and vibrant as well.



Once we got the Color LaserWriter 12/600 PS running, however, we were extremely impressed with its smooth and vibrant color output. In newsletter test documents, colors were far brighter than those produced by QMS's Magicolor LX, which appeared muted in comparison. Text output was crisper and sharper, too. White text on a colored background, which can be tricky, proved to be no problem for the LaserWriter 12/600 PS. And complex grayscale documents were sharp as well, with detailed shading and smooth highlights.

Photographic output, while better than the Magicolor's, wasn't quite perfect. Flesh-tone images were rosy and blurry. But other photographic images were crisp—we noticed more detail in the Color LaserWriter's images than in images produced by Tektronix's Phaser 540 color laser.

While Apple's LaserWriter has a rated engine speed equivalent to that of QMS's Magicolor LX, the Color LaserWriter performed consistently slower. For example, the LaserWriter was more than 600 percent slower than the Magicolor at producing a multipage newsletter.

Apple's Color LaserWriter 12/600 PS is a welcome addition to the color-laser printer market. It offers first-rate color output at a competitive price. If you plan to print in a mixed environment of Macintosh and Windows PCs, the Color LaserWriter 12/600 PS has your name written all over it. **KYLA K. CARLSON**

FILEBOX

Color LaserWriter 12/600 PS

Usability ★★★½
Technology ★★½
Verdict ★★★★½
High-quality color-laser output perfect for a cross-platform workgroup on a network.

Competition: Hewlett-Packard, QMS, and Xerox have competitive color-laser offerings. HP's $5,999 Color LaserJet doesn't offer 600-dpi resolution, and models from QMS and Xerox cost hundreds more after you add equivalent networking features and the extra memory required for 600-dpi resolution.

Features as Tested: Adobe's PostScript Level 2, 600 dpi, 12MB of RAM, and AppleTalk, Ethernet, and TCP/IP support.

Cost per Page: 3 cents for black and white; 15 cents for color.

Rated Engine Speed: 12ppm for black and white, 3ppm for color.

$6,550 est. street price
Apple Computer
(800) 462-7753, (408) 996-1010
Reader Service No. 602

PHOTOGRAPH BY ARNOLD TOSELO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

A Portable Mac That Does Windows

SNEAK PREVIEW

The way Macintosh PowerBook users flourish their machines in public is enough to make you heave.

But then again, perhaps such snobbery is warranted: Impressively sleek with outstanding usability, the jaunty Macintosh portables make splendid travel companions for PC-based users who need only communications and light word processing capabilities. Serious productivity is another matter, of course. For that you need Windows. And as we all know, PowerBooks can't run Windows—until now.

Move Over, Intel Apple's long-awaited 5000 series of PowerBooks ushers in the company's first line of portables that use the powerful 100MHz (or 117MHz) PowerPC 603e RISC processor, jointly developed by Motorola, IBM, and Apple. If you install Insignia Solutions' SoftWindows 2.1 ($299), the notebooks let you hopscotch between Apple's System 7.5 and Microsoft's Windows—with no need to reboot.

The top-of-the-line PowerBook 5300C will even appeal to dedicated Windows users who'd rather eat worms than tote a Mac around in public. Its feature set now competes with some of the best Windows portables on the market.

Apple has finally outfitted the PowerBook with an industry-standard 10.4-inch thin film transistor (TFT) display. Also, the stingy hard drive options available in previous PowerBooks have been bumped up to 1.1GB capacity. Infrared and 16-bit audio are standard. There's an integrated microphone (but alas, only one speaker), along with a complement of audio I/O jacks. In addition, the PowerBook uses a charge-frugal lithium-ion battery.

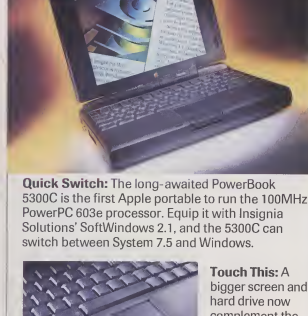
Also, the floppy drive pops out, revealing what Apple calls the expansion bay, which is essentially an IDE connector with two power lines. Fujitsu has already announced a magneto optical drive for it. Removable hard drives will certainly follow. Both technologies are excellent alternatives to power-slogging CD-ROM drives for multimedia presentations. (Incidentally, Apple has scotched much-rumored plans to build a 3.5-inch CD-ROM drive.)

Yes, the native Mac performance is impressive, but will you really want to run Windows in software emulation? The newest version of Insignia Solution's SoftWindows can churn Windows code in Enhanced Mode, and there's better multimedia support than in previous versions (still no Sound Blaster–compatible audio, though). But overall Windows performance is dreadfully slow.

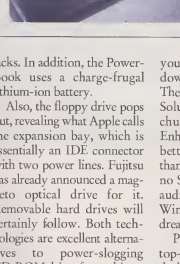
Picture yourself running a top-drawer $3,800 notebook, decked out to the nines with bleeding-edge technologies, on a 25MHz 386 processor. Not what we would call a pretty picture.

Should you flatly ignore the PowerBook 5300C? Not necessarily. As many Windows users have discovered, cross-platform support for basic-productivity applications has become quite good in the past three years. And basic communications, like e-mail and fax, are platform independent. If you need to live with one foot in either world, the PowerBook 5300C is an excellent workaround.

Meanwhile, Insignia Solution's Windows 95 version of its emulator should appear by early next year. (You can run Windows 95 under the current emulator, but at these speeds, you don't want to—trust us.) Performance should be much better by then. **MARTY JEROME**



Quick Switch: The long-awaited PowerBook 5300C is the first Apple portable to run the 100MHz PowerPC 603e processor. Equip it with Insignia Solutions' SoftWindows 2.1, and the 5300C can switch between System 7.5 and Windows.



Touch This: A bigger screen and hard drive now complement the PowerBook's trademark design, as does the signature touch-pad pointer.

FILEBOX

Macintosh PowerBook 5300C

Usability	★★★★½
Performance	★★★★
Technology	★★★★
Verdict	★★★★

Pricey, but this portable's usability is ne plus ultra.

Configuration Tested: 117MHz. PowerPC 603e, 8MB of RAM, 500MB hard drive, lithium-ion batteries, and built-in audio.

Configuration Options: The Macintosh PowerBook 5300 includes a passive-matrix monochrome screen, 8MB of RAM, and a 500MB hard drive; the PowerBook 5300CS includes a dual-scan color screen, 8MB of RAM, and a 500MB hard drive. the PowerBook 5300CE includes an active-matrix screen, 32MB of RAM, and a 1.1GB hard drive.

Coming Mid-October: PowerPC subnotes (2300C) with active-matrix color screens.

$3,800 est. street price
Apple Computer
(800) 538-9696, (408) 996-1010
Reader Service No. 603

PHOTOGRAPHS BY ARNOLD TOSKE/O

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*



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A Jukebox on Every Desktop

SNEAK PREVIEW

NEC Technologies, long a pioneer of CD-ROM drives, is playing a good game of catch-up with another pioneer—Pioneer New Media—which has, until now, led the way in CD-ROM jukeboxes. Like a music jukebox in a honky-tonk, these drives hold from 6 to 18 CDs, and can switch among discs in just seconds. To your software, it looks like you have a separate CD drive, each with its own drive letter, for every disc the jukebox holds. NEC now has its own seven-disc jukebox at a price that not only swamps Pioneer, but makes you think twice about buying any CD-ROM drive that holds only one disc.

Neck and Neck Both Pioneer's DRM-624X and NEC's MultiSpin 4Xc are quad-speed drives, and in our performance tests using multimedia PC 2 (MPC 2) benchmarks, the drives are close enough that you won't notice one delivering data any faster than the other. The MultiSpin 4Xc has a quicker access time, but Pioneer's DRM-624X is a bit faster at transferring data. Both far exceed minimum MPC 2 requirements. Instead, what differentiates the drives is their ease of use, capacity, and price.

Pioneer's DRM-624X uses a cartridge that has trays for up to six CDs. You remove the cartridge, and then manually open each tray, place a CD in it, and close it. The advantage is that you can keep groups of related CDs in different cartridges. For example, you can change from a cartridge loaded with dictionaries, encyclopedias, and other word processing tools, to one that contains a collection of national telephone directories.



Quad-Speed CD Changers: Why waste money on a single-disc CD-ROM drive when you can queue up six—or even seven—discs at once for the same price with Pioneer's DRM-624X or NEC's MultiSpin 4Xc?

PICKS MULTI-DISC **CD-ROM** DRIVES

A six-disc, multiple-tray, quad-speed jukebox.	Pioneer DRM-624X
A seven-disc, single-tray, quad-speed jukebox at a bargain price.	MultiSpin 4Xc

What's Spinning? Pioneer's quad-speed jukebox is nice if you want individual trays for each of your CDs, but NEC's MultiSpin 4Xc drive adds a seventh disc slot, and costs several hundred dollars less.

The downside is that the trays are slightly awkward to handle and you must load the disc slot upside down, making it difficult to see which tray holds what CD. The MultiSpin 4Xc takes an entirely different approach. It has only one tray, which slides in and out like trays on most single-CD-ROM drives. Disc manipulation takes place out of sight, inside the changer. Each of the seven buttons, which are placed in a row across the front of the jukebox, causes a different disc to be loaded into the tray. The tray then opens so that you can take the CD out and replace it with another one. What's missing? A nice LCD readout that shows the label name of each disc.

So Similar, So Different Both the Pioneer and the NEC models need about 10 seconds to unmount one disc and mount a different one. Both changers have footprints about the size of a shoe box. Both are SCSI drives, although the NEC comes with a SCSI controller and the Pioneer doesn't. And both are from reliable drive makers.

There are, however, two important differences. First is the number of discs each changer can handle. As your collection of CDs grows, there will come a time when you'll appreciate the extra disc NEC's MultiSpin can handle. Second, you'll appreciate its estimated street price: $349. Not only is it cheap enough to put the Pioneer, at $580, out of the running, it's cheap enough to rule out buying a single-disc drive, which costs about $200 on the street. For $150 more, you get the equivalent of six more drives. That brings the cost of each virtual drive to $50—the best bargain this side of a one-cent sale. My check's in the mail. RON WHITE

PHOTOGRAPH BY ARNOLD TSOE/IO

FILEBOX

MultiSpin 4Xc

Usability	★★★★★
Performance	★★★★
Technology	★★★★
Verdict	★★★★½

Easy to use; best bargain you'll find this year.

System Requirements: SCSI adapter (included).

Competition: Mountain Network Solutions' CD7 Minichanger also holds seven discs, but is a double-speed drive.

$349 est. street price
NEC Technologies
(800) 632-4636, (508) 264-8000
Reader Service No. 604

Pioneer DRM-624X

Usability	★★★★
Performance	★★★★
Technology	★★★
Verdict	★★★★

A giant improvement over any single-disc changer.

Competition: The only quad-speed, multi-tray, six-disc jukebox available.

System Requirements: SCSI adapter (not included).

$580 est. street price
Pioneer New Media
(800) 444-6784
Reader Service No. 605

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*



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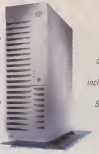
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A Pricewise Traveling Totable

As much as we love NEC's ingenious Versa portables, their price tags tend to give us altitude sickness. Such is the burden of technology leadership. Now comes the Versa 2000C—a full redesign—which leverages that leadership while appeasing the browbeaters in your purchasing department: Prices start at a seductive $1,999.

Power to the People

Despite a new look and fetching prices, the 2000C series cuts no corners. Powered by 75MHz DX4 processors, the machines come with either a 10.4-inch, dual-scan passive-matrix screen or 9.5-inch active-matrix display, accelerated video running on a local bus, a removable hard drive (350MB to 720MB options), lithium-ion batteries, two Type II PC Card slots, and enough software to keep you as productive as a Taiwanese fireworks factory.

The top-of-the-line Versa 2000C, which we tested, costs only $2,799, and can stare down many machines that cost up to $1,500 more. It features a bright thin-film transistor (TFT) color display with more than 65,000 colors at 640-by-480-pixel resolution. And yes, the notebook does include simultaneous external and LCD video for presentations.

A 14.4Kbps fax modem is standard equipment, leaving your PC Card slots free for other devices. The machine's standard 8MB of RAM is expandable to 40MB. And there's a 540MB hard drive.

The Versa 2000C comes with Windows for Workgroups 3.11, Quicken Special Edition, FaxWorks 3.0, Lotus Organizer, NetCruiser Plus, and Remote Co/Session, among a score of other programs. Given this bundle, along with the machine's affordable price and feature set, it's clear that NEC hopes to herd the Versa 2000C into small businesses and corporate notebook pools, not to mention into the paws of everyday consumers.

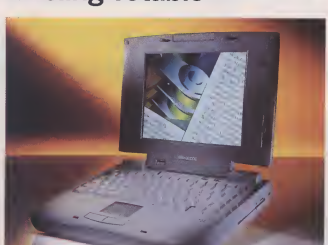
Up to Snuff? Usability on the machine is both better and worse than on previous models. Like its pricey, high-end cousin, the Versa 2000C is big and heavy: 9.4 by 11.8 by 2 inches and 6.5 pounds. Given the extra size and weight, we wish the TFT display were a full 10.4 inches, like on many other notebooks today.

The larger footprint accommodates a wrist rest and an inviting keyboard layout (generous key travel as well). It also introduces NEC's TouchPad pointing device. Two large, concave mouse buttons sit side by side directly below it. (Don't tell anyone who recently shelled out $5,000 for a Versa P, but typing comfort on the Versa 2000C is considerably better.)

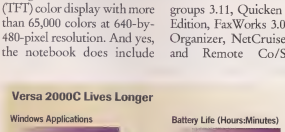
To our dismay, the Versa 2000C loses the LED display for system status that's found on other Versas, and there's no built-in audio support. Also, you can't upgrade the display to a high-resolution model or swap out the floppy drive for another device—both of which are NEC innovations.

These are small sacrifices, given the cost savings on the Versa 2000C. In fact, using its $599 MediaDock docking station with a quad-speed CD-ROM drive, stereo speakers, power amplifier, and MIDI-device support, the machine packs enough power to double as your desktop system.

Or does it? Perhaps Pentium power is a must for many businesspeople—in or out of the office. But for those who can get by with less power, NEC's Versa 2000C provides a strong alternative. Put it on your shopping list. **MARTY JEROME**



Next Generation: A complete redesign of NEC's high-end Versa portable, the 2000C loses a few advanced features, but gains points for usability with its bright display, wrist rest, and TouchPad pointer.



NOTE: WINSTONE 95 IS A BENCHMARK THAT RUNS 13 OF THE MOST POPULAR WINDOWS BUSINESS APPLICATIONS. THE ZDBOT BATTERY TESTS ELECTRONICALLY SIMULATE COMMON USER ACTIVITY.

Balancing Act: NEC's Versa 2000C and Toshiba's Satellite T2130CT are neck and neck in Windows performance. But the Versa 2000C lurches ahead in battery life.

FILEBOX

Versa 2000C

Usability	★★★½
Performance	★★★★
Technology	★★★★
Verdict	★★★★

A fierce alternative to barebones bargain boxes.

Competition: Compaq's Contura 420CX and Toshiba's Satellite T2130CT compete on core features, but the Versa 2000C offers slightly more for your dollar.

Features as Tested: 75MHz DX4 CPU, 8MB of RAM, 540MB hard drive, two Type II PC Card slots, lithium-ion batteries.

$2,799 est. street price
NEC Technologies
(800) 632-8372
Reader Service No. 606

PHOTOGRAPH BY ARNOLD TOSELLO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*



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FOR MORE DETAILS ON PC 300s, CALL 1 800 772-2227[3]

[1]Entry-level PC Direct price for 75MHz/540MB HDD. Dealer prices and product availability may vary. [2]IBM's Statement of Limited Warranty is available upon request by calling 1 800 772-2227. [3]In Canada, call 1 800 465-7779. IBM, OS/2, and HelpWare are registered trademarks and SelectaSystem and "There is a difference." are trademarks of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. Windows is a trademark of Microsoft Corp.©1995 IBM Corporation

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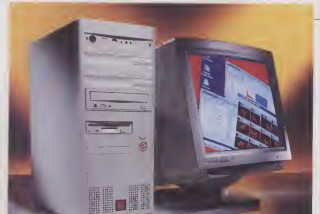
A Rocket Disguised as a PC

Just because a PC is equipped with a 133MHz Pentium chip doesn't mean it will run circles around every other system in the office. That is, unless it's Polywell's new Poly P133T5. Fueled by top-notch components, including a generous 512K cache, a Diamond Stealth64 PCI graphics card with 2MB of VRAM, and a Quantum Fireball 1.08GB Enhanced IDE disk drive, the Poly P133T5 edged out its competitors in our lab tests.

The Poly P133T5 comes standard with a Triton PCI chip set and Award flash BIOS. Look closely and you'll see room for an additional 128MB of EDO RAM, and a built-in EIDE controller that runs up to four devices. You'll also find a Sound Blaster 16 sound card, stereo speakers, a Panasonic quad-speed IDE CD-ROM drive, and a high-resolution 17-inch monitor. Inside the Poly P133T5 you'll find four PCI and four ISA slots, and a 230-watt power supply.

For those worried about obsolescence, the Poly P133T5 will accept the 150MHz Pentium OverDrive CPU when it becomes available.

Whether you're building complicated spreadsheets or playing Descent, at $3,595, Polywell's Poly P133T5 is an excellent value with no compromises. ADAM MEYERSON



Record-Breaking Speed: Polywell's Poly P133T5 133MHz Pentium turned in the fastest times we've seen in our Windows application tests.

FILEBOX

Poly P133T5

Usability	★★★★
Performance	★★★★★
Technology	★★★★½
Verdict	★★★★½

New leader in the 133MHz race.

Competition: 133MHz Pentiums from Dell and Gateway are only a hair slower than the Poly P133T5. But Polywell's offering comes at a lower price, and is chock-full of the best components.

Features as Tested: 133MHz Pentium, 16MB of RAM, DOS 6.22, Windows for Workgroups 3.11 or Windows 95, 1.08GB Quantum Enhanced IDE drive, Panasonic quad-speed IDE CD-ROM, Sound Blaster 16, 512K cache, Diamond Stealth64 (S3 968 chip) with 2MB VRAM, and a Sampo 710 17-inch monitor.

$3,595 est. street price
Polywell Computer
(800) 999-1278
Reader Service No. 607

MGA Millennium

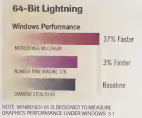
Graphics for the Next Millennium

Crave speed? Then don't overlook the video bottleneck in your system. The new generation of 64-bit Windows accelerators, with their high-resolution, true-color images, will not only improve your outlook on Windows, they'll also turn any PC into a high-speed graphics machine—and none more so than Matrox's new MGA Millennium accelerator.

Based on the new MGA-2064W chip, the MGA Millennium is currently the fastest accelerator you can buy, thanks to a new dual-ported memory technology called Windows RAM (WRAM). Even with 4MB of memory (enough for 24-bit color at high refresh rates and at resolutions of 1,024 by 768 pixels and higher) the MGA Millennium will only set you back $480. Matrox also sells a 2MB version for $339.

With the MGA Millennium, Matrox also addressed a problem many had with its earlier boards: slow DOS performance. It now holds its own in this arena.

The MGA Millennium offers built-in 3-D acceleration, and includes some 3-D games and apps to get you started. Like Matrox's earlier boards, the MGA Millennium is ahead of its time. But if you want the ultimate accelerator today, why wait? WENDY TAYLOR



Why Wait? Windows RAM makes the Millennium the fastest 64-bit accelerator.

FILEBOX

MGA Millennium

Usability	★★★★
Performance	★★★★★
Technology	★★★★★
Verdict	★★★★½

The fastest 64-bit accelerator you can buy—3-D included.

Features as Tested: 4MB of WRAM, 1,024 by 768 resolution at 24-bit color, PCI interface, onboard 3-D acceleration, and a software MPEG decoder.

$480 est. street price
Matrox Graphics
(800) 361-1408, (514) 685-7230
Reader Service No. 608

PHOTOGRAPH BY ARNOLD TORSO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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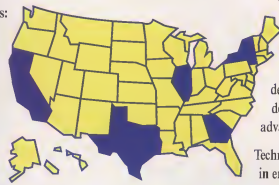
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Charles B. Hamlin
Vice President, Corporate Marketing

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Lisa Levine

CASE STUDY

Timberland

Timberland uses Lotus Notes as the backbone of its apparel planning process to quickly consolidate, organize and disseminate design, marketing and production information worldwide. Notes has re-engineered the process, allowing the company to take all apparel lines "from concept to market". Notes is also used as a data analysis tool allowing Timberland to do complete analysis of inventory, production balances, even to track the most popular colors. With Notes, the field and international operations feel more tied to the home office and the apparel planning process. Notes keeps the pace of the business moving, because management can constantly monitor the process, keep everyone updated, and make sure all the necessary information has been added.

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CASE STUDY

Mission Energy Corp.

Mission Energy Corp., a $2.9 billion division of Southern California Edison, builds, manages and finances power facilities around the world. Mission Energy has deployed Lotus Notes to all international employees, connecting these remote locations together into one unified company. And the distant locations can act and react as a single company. "It's like 300 different brains can contribute to a discussion or work to resolve a problem at the same time." The company uses Notes for project management and planning, to manage customer and account information, to get up-to-date news and information and to keep traveling executives in touch with the home office.

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CASE STUDY

Burger King

Burger King used Lotus Notes to re-engineer its regional operations and get back to the business of selling burgers, soft drinks and fries. Burger King created small, highly mobile, multi-disciplined regional teams of individuals. Each team consists of expertise in construction, real estate, purchasing, marketing and service. Each self-managed team is now responsible for restaurant accounting, determining credit fitness, employee relations, expansion approval and recruitment — all functions formerly handled at headquarters.

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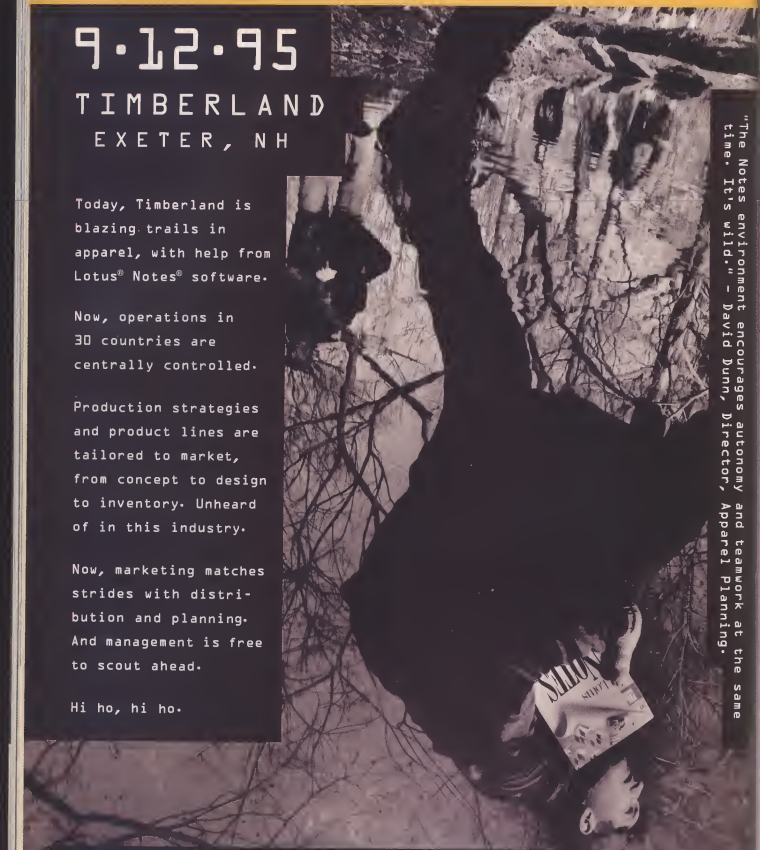
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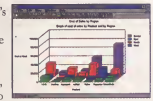
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CASE STUDY

Fireman's Fund Insurance

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CASE STUDY

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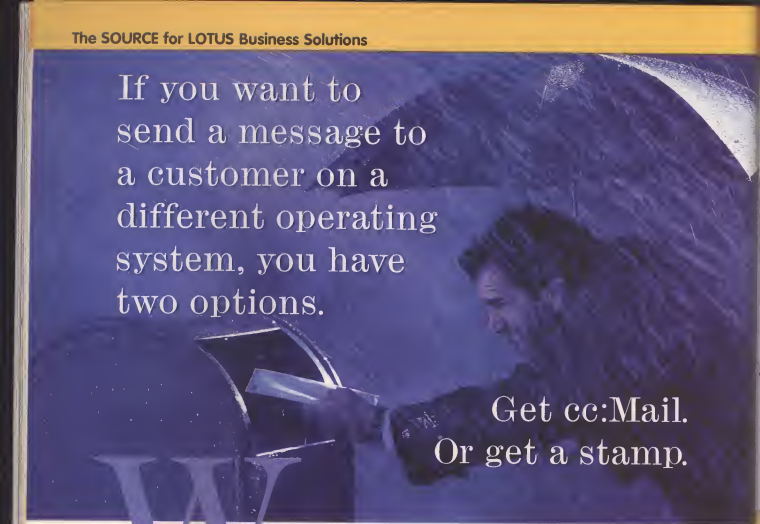
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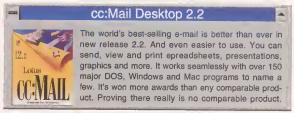


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CASE STUDY

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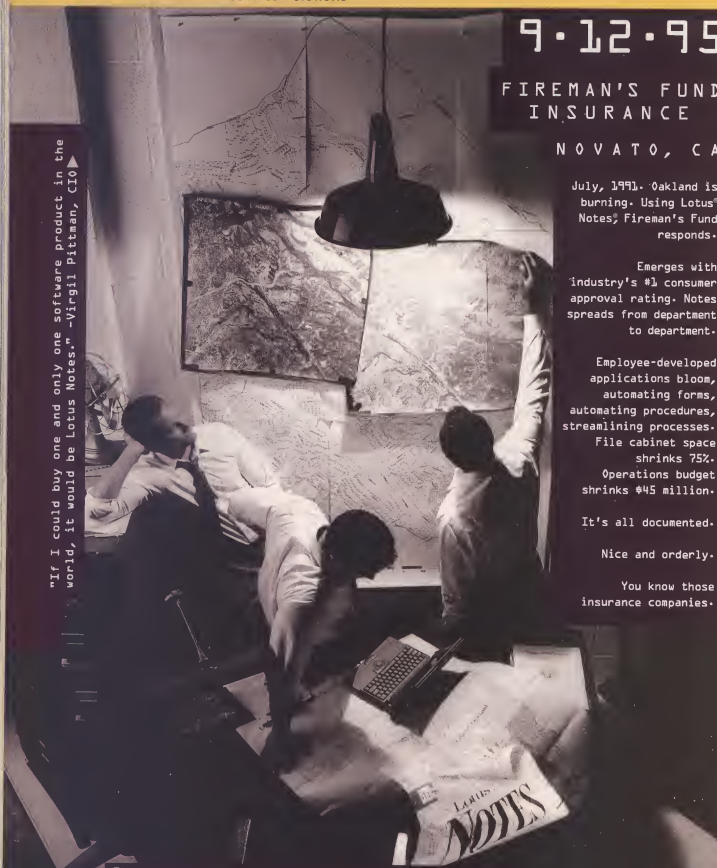
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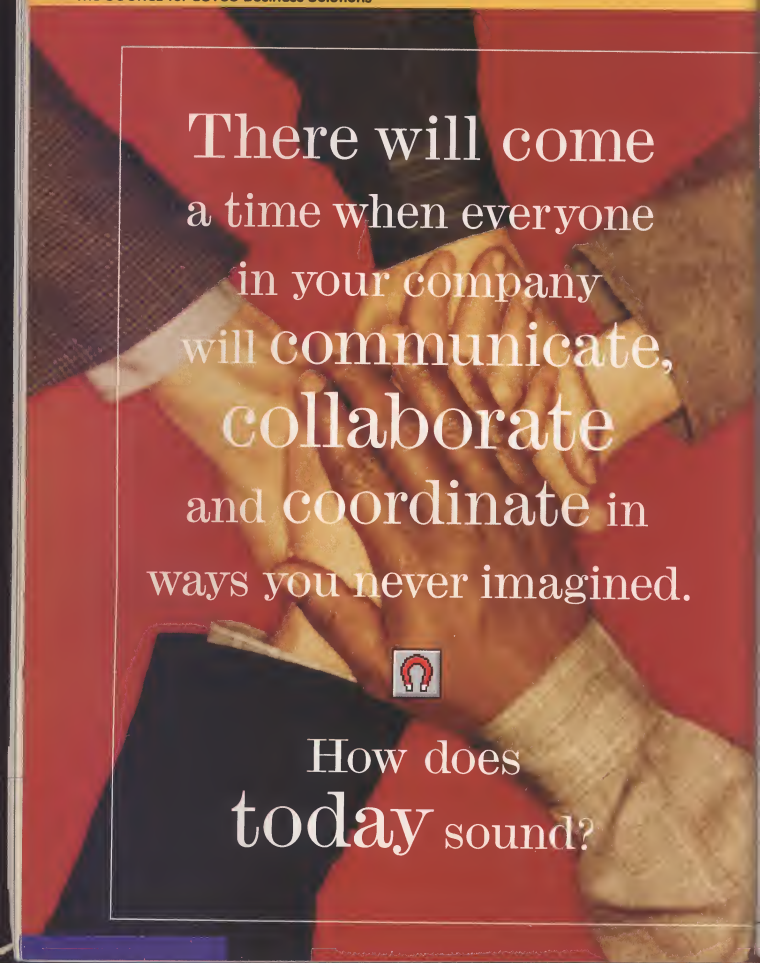
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TEL: (908) 842-3527
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Joe King

CASE STUDY

Boston Chicken

Boston Chicken, the restaurant chain that is one of the fastest-growing companies in the U.S., relies on Notes to keep track of expansion plans, market research, advertising copy, cooking procedures and recipes. Says President Bruce Harreld: "We couldn't keep growing 100% a year without this type of technology."


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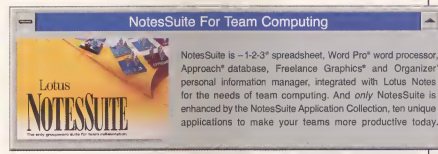
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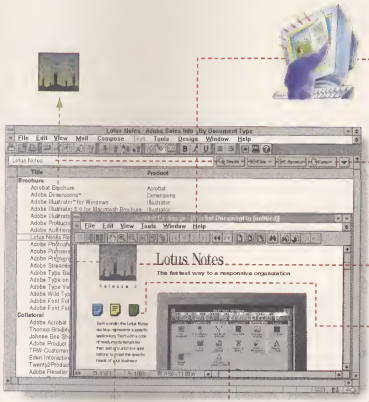
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Money for Windows 95

Banking on Easy Money

SNEAK PREVIEW

The hassles of paying bills and keeping track of personal bank accounts are as sure as death and taxes. One way to simplify your financial life is to conduct financial transactions online. With this in mind, Microsoft's newest version of Money makes it easy to jump right into your bank's mainframe and check account balances, transfer funds, and pay bills in a fraction of the time you'd spend doing these tasks offline. Banking via PC should really take off this fall, when more than 50 of the nation's largest banks will offer either Money for Windows 95 or Quicken 5 to more than 40 million customers. So which should you choose?

Money vs. Goliath

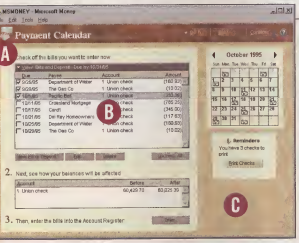
Microsoft, thwarted in its efforts to compete with Intuit's market-dominating Quicken, has repositioned Money for the millions of consumers who haven't yet embraced personal financial software. Microsoft stopped chasing Quicken's expanding feature set to concentrate on three fundamental tasks: paying bills; performing transactions in bank accounts; and tracking the status of bills, checks, and deposits.

In addition to these primary functions, Money includes a robust toolkit with financial calculators, a payment calendar, and charts that keep you in constant touch with your finances. But with personal financial software, usability is nearly as important as functionality. Money excels in this arena as well, by offering an interface that's accessible yet professional. It uses the same basic approach as that of Quicken's HomeBase, but Money has a more elegant feel.

Like HomeBase, Money's opening screen focuses on basic tasks instead of features, and it gently leads the novice through common activities like paying bills. Click on the Payment Calendar, for example, and Money reaches across its different modules to assemble all the tools you'll need on a single screen. Money also includes common Quicken conveniences such as zooming down to the origin of a chart's data point and automatically entering data for familiar transactions.

Money or Quicken? If you're one of the 8 million Quicken users, Money offers no compelling reason to switch. Quicken 5, due out this fall, will offer similar online banking from many of the same banks, and it will still be a generation ahead of Money in features. Let's face it: The easiest interface in the world is the one you already know. But if you're new to financial management and don't need Quicken 5's complex home inventory, payment calendar, or portfolio management features, Money deserves a look.

Both products are inexpensive, and you'll be able to use either at many banks. Because they read each other's files, you can start with Money and then move up to Quicken. But whatever you do, don't pass up the opportunity to manage your finances online. MIKE HOGAN

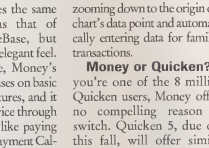


Organize Your Money: Money for Windows 95 tracks your finances on your PC—from paying bills online to balancing your checkbook. Although it lacks many of the advanced features of Quicken, Money handles the basics with ease.

A. The **Payment Calendar** includes a list of bills coming due.

B. Pick and choose the **bills** you want to pay.

C. Money for Windows 95 supports **long filenames** and **right–mouse-button** menu commands.



Futures: Money tracks the major details of your finances, including net worth.

FILEBOX

Money for Windows 95

Usability	★★★★½
Technology	★★★★
Verdict	★★★★

Everything you need to do your banking online.

Competition: Intuit's Quicken 5 offers many of the same features, with similar online-banking and bill-paying schemes. It is also backed by a longer track record, a larger installed base of users, and more add-in products.

Minimum System Requirements: 486 processor, Windows 95, 8MB of RAM, 6MB of hard disk space.

Free: Microsoft is distributing free copies of Money for Windows 95 through October 31. Download the program from Microsoft Network, or order the disks and manual directly from the company (plus $9.95 fee for postage and disks).

$35 est. street price
Microsoft Corp.
(800) 426-9400, (206) 882-8080
Reader Service No. 612

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Data-Saving Utilities for Windows 95

SNEAK PREVIEW

Microsoft's Windows 95 delivers an enticing new interface, greater stability, and better performance to your desktop. But what about your software? While most Windows 3.*x* applications at least run under Windows 95, many disk and system utilities will not. Fortunately, Symantec has a solution: Norton Utilities for Windows 95.

Norton Utilities for Windows 95 has all the tools of its predecessor as well as a dozen new ones, including Norton System Doctor and Disk Doctor. Before you install Windows 95, Norton Utilities examines your existing Windows system with a suite of Pre-Install Tune-Up utilities. These utilities free up disk space while defragmenting your hard disk (which could save hours during Windows 95 installation), and let you trim away duplicate files to make room for new ones. Plus, if Windows 95 is corrupted and won't load, Norton includes a full set of DOS utilities that can be used to repair the Windows 95 file system. If your hard drive won't boot at all, you can use those same utilities on the emergency start-up disk.

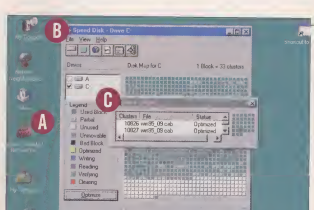
Tune-up Most of the 32-bit applets included with Norton Utilities are simply updates of old favorites like Rescue Disk and Disk Doctor. Others, like the Enhanced Recycle Bin, add functionality that compensates for missing Windows 95 features.

One of Norton Utilities' primary functions is to keep your disks healthy, and Norton Disk Doctor tops the tools list. This utility, which can be accessed from either the file menu or through right-mouse-button clicks, examines any disks you specify (including floppy disks), diagnoses problems, and, in most cases, fixes them. Anything from unreadable files or bad boot-up records to cross-linked files can be fixed using Norton Disk Doctor.

Just as important is the all-new Norton System Doctor. This utility is controlled from a floating toolbar and monitors more than 70 system resources in the background. You can monitor just about any system statistic with Disk Doctor, including disk space, CPU usage, graphics device interface (GDI) resources, user resources, RAM, and even the length of time since you last rebooted. Symantec leveraged Windows 95's multithreaded design so that Norton's background activity runs at the lowest system-resource priority, minimizing the effect on overall system performance.

Total System Control Symantec maintains a consistent look and feel that's compatible with Windows 95, including right-mouse-button support and extensions to default Windows Property sheets. Property sheets let you fine-tune the statistics you're monitoring. For example, the Disk Integrity monitor lets you scan one or more disks automatically at user-defined intervals (the default is one hour). If it discovers an error, you can correct it automatically, or set an alert and then decide what action to take.

Any job is easier if you have the right tools, and performing daily maintenance on your PC is no exception. But even if defragmenting your hard drive once a week isn't your first priority, don't install Windows 95 without first getting Norton Utilities for Windows 95. ADAM MEYERSON



Optimize and Stabilize: Get the most from your Windows 95 system with Norton Utilities for Windows 95. Several of the utilities are 32-bit updates of old favorites like Disk Doctor; others, like the Enhanced Recycle Bin, improve on Windows 95 features.

A. The Protected Recycle Bin prevents you from accidentally deleting files.

B. Speed Disk, a 32-bit disk defragmenter, is faster than ever.

C. Point to an individual **block detail** for file-space information.



Desktop Doc: Get details on your system's disk space and cache hits from Norton System Doctor.

FILEBOX

Norton Utilities for Windows 95

Usability	★★★★½
Technology	★★★★
Verdict	★★★★

A critical toolkit for keeping Windows 95 systems healthy.

Competition: Symantec bought its biggest competitor last year—Central Point's PC Tools. Norton Utilities is currently the only complete set of system and disk utilities for Windows 95. Windows 3.1 and DOS versions are also available.

Minimum System Requirements: 486 processor, 4MB of RAM, Windows 95.

Utilities: Norton System Doctor, Norton Disk Doctor, Disk Integrity Monitor, Space Wizard, Speed Disk, Unerase Wizard, UnFormat, Advanced Disk Editor, Enhanced Recycle Bin, Emergency Disk, Norton Diagnostics, Rescue Disk, and an extended set of DOS tools.

$119 est. street price, $129 for CD-ROM version, $69 upgrade available for registered Norton Utilities users.
Symantec
(800) 441-7234, (408) 253-9600
Reader Service No. 613

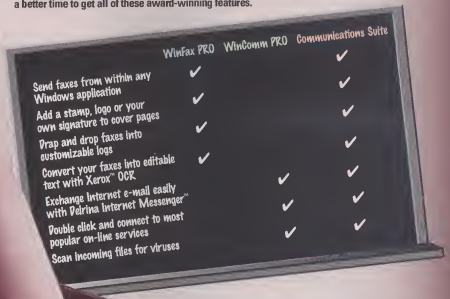
Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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Circle 183 on reader service card.

New! SOFTWARE: FreeHand 5.0

Free-form Drawing and Design

Quick! When should you use a menu and when should you use a palette? How about Xtras, Operations, Transformations, or the Path Inspector? Don't know? Well, neither does Macromedia's FreeHand 5.0, but that doesn't stop it from delivering powerful drawing and painting tools.

FreeHand has been through a number of owners—Altsys, Aldus, Adobe, and now Macromedia—and it's beginning to exhibit multiple personalities. Veteran users won't be bothered by its inconsistencies, but newcomers might be thrown off. FreeHand offers substantial power, but this is tremendously compromised by its confusing interface. It's unclear why some features appear on menus, some on toolbars, and some in pseudo-toolbar areas with arcane titles.

Looking for a gradient or radial fill? Go to the Path Inspector. But for a multicolor fill, you must go to the Operations palette or Xtras menu. Want to rotate an object? Try the Transform or Tool palettes. But wait—if you want 3-D rotation, you'll need the Xtra Tools palette. Get the idea?

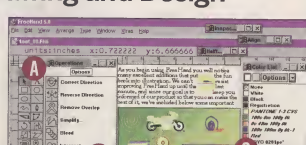
Powerful object tools like Blend, Intersect, and Union reside in three different places—under two separate menus and on a palette. This makes for unnecessary clutter: You can customize the number and location of the palettes, but you can't tile them. Do they roll up? Yes. Can you resize them? Some yes, some no. Can you add and delete features and buttons? No.

Flying Colors Interface glitches aside, FreeHand's color handling is great. You can choose colors from a wide range of color libraries, including Pantone and Focoltone, or create custom colors with the Color Mixer using CMYK, RGB, or HSC color models. You can also specify tints. These colors must then be added to the Color List. Unfortunately, you have to go through this process for each new drawing because no default color list is supplied. Colors are saved with each drawing, but there's no easy way to create color libraries, save customized hues, or import colors. FreeHand does, however, automatically add colors contained in imported EPS files.

To apply color to an object, simply drag and drop a color onto the object. Or use the eyedropper tool to apply color—even from bit-mapped images.

Easier Text FreeHand 5.0 offers improvements in text handling, but inconsistencies abound here, too. You can edit text in place or in the text editor. You can apply font attributes from the Type menu or Type palette, but kerning and leading adjustments must be made solely from the Text Inspector. Style sheets, on the other hand, are found on the Style palette under Windows. FreeHand does offer irregular text wrap, but it can't be applied to blends, grouped objects, or OLE objects. The Knife is FreeHand's coolest tool. With a single stroke you can slice a complex object into multiple objects, each of which becomes a closed path, retaining all of the attributes of the original object.

FreeHand 5.0 is a capable program, but interface flaws detract from its usability. Veteran users will want to upgrade to version 5.0, but if you value ease of use, consider CorelDraw and Adobe Illustrator before choosing. **MARTY BEAUDET**

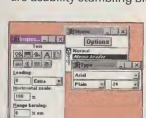


Artist's Palette: Macromedia's FreeHand 5.0 offers powerful drawing and painting features, but its redundant floating palettes (only some of which are resizable) and awkward interface are usability stumbling blocks.

A. FreeHand is loaded with **advanced features**, but they're spread among multiple palettes.

B. You can **roll up palettes** when they're not in use, but you have to manually arrange them.

C. Create a color in the **Color Mixer,** then drag and drop it into the **Color List** to apply it.



The Text Test: Three toolbars to control text attributes? That's too many—and it masks the capable text handling that FreeHand really offers.

FILEBOX

FreeHand 5.0

Usability **
Technology ***
Verdict ***
Highly capable illustration package, but suffers from interface inconsistencies.

Competition: FreeHand 5.0 leapfrogs rival Adobe Illustrator in features, but it's outstripped by CorelDraw 6.0's ease of use and Windows 95 compliance.

Minimum System Requirements: 486 processor; 12MB of RAM; 25MB of hard disk space; high-resolution graphics adapter; and Windows 3.x, Windows NT, or Windows 95.

Features: Commercial printing guide, drag-and-drop color, autotrace, paste inside, trapping, four-color separation. Support for pressure-sensitive stylus, importing of CorelDraw 3.0 and 5.0 files and Illustrator files, Pantone color handling, creating custom colors (using CMYK, RGB, or HSC formats).

$390 est. street price, $149 upgrade
Macromedia
(800) 438-5080
Reader Service No. 614

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

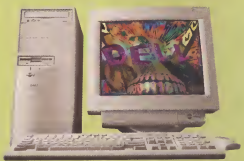
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New! SOFTWARE: Norton AntiVirus for Windows 95

Virus-Proofing Windows 95

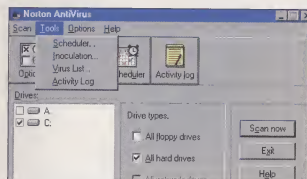
SNEAK PREVIEW

If you're moving to Windows 95, there's probably a virus in your future. And chances are, you're not protected. All of the 3,000 or more current viruses can infect a Windows 95 system, while existing 16-bit virus utilities have a slim chance of detecting or eradicating them. With this in mind, you should consider Symantec's Norton AntiVirus for Windows 95.

Protecting your files from the likes of Michelangelo is serious business. Norton AntiVirus fights back with a three-pronged approach: detection, repair, and prevention.

Whether you want to scan hourly, daily, or weekly, you can schedule Norton AntiVirus to do the job for you. There's also the Auto-Protect option: Every time you boot up your system, Auto-Protect launches automatically. It stops viruses with a virtual device driver before they can infect your system. This driver allows Norton AntiVirus to constantly monitor your system for any invading viruses, both known and unknown. Because new viruses are continually cropping up, Symantec also offers updated listings for download.

With the new Norton AntiVirus for Windows 95, you can relax—at least about viruses. ADAM MEYERSON



Are You Protected? Because 16-bit virus scanners won't work under Windows 95, many viruses can still infect your system. Norton AntiVirus is the first 32-bit virus scanner designed for Windows 95.

FILEBOX

Norton AntiVirus for Windows 95

Usability ★★★★
Technology ★★★★½
Verdict ★★★★½
So thorough that viruses don't stand a chance.

Competition: Expect products from McAfee and Cheyenne in the near future, but Symantec's Norton AntiVirus is the first for Windows 95.

$79 est. street price
Symantec
(800) 441-7234
Reader Service No. 616

Ecco Pro 3.0

Contact Management Meets the Net

These days, it's not enough for a personal information manager to track just names, addresses, and phone numbers. It should also keep tabs on your e-mail addresses, favorite Internet sites, newsgroups, and everything else. NetManage's latest release of Ecco Pro, version 3.0, is the first to manage Web sites as easily as contacts.

Ecco Pro 3.0 packs in several new features. Outlines have been replaced with familiar yellow notepads. Maneuvering among these notepads is a snap—just click on the colored tabs at the bottom of the screen. The PhoneBook includes entry screens that resemble Rolodex cards. And Ecco's calendar now uses a three-ring binder motif à la Lotus Organizer.



Choose Your View: NetManage's Ecco Pro 3.0 personal information manager gets a new interface and the Internet Address Book, a list of more than 2,000 sites organized by topic.

Most interesting, however, is Ecco Pro's unique Internet support: It ships with the Internet Address Book, which contains more than 2,000 Web, Gopher, and FTP sites organized by topic. Add your own entries to this list and use it as a personalized directory of Net sites. If you're surfing and need to capture the address or some information from a hot new Web page, you can use a feature called the Shooter to highlight the information and transfer it to any other Windows application.

Ecco Pro 3.0 continues to emphasize power over ease of use, so beginners may be somewhat bewildered by the outline-style organization. The version we tested works under Windows 95, but a fully Windows 95–compliant version is still in the works. KYLA K. CARLSON

FILEBOX

Ecco Pro 3.0

Usability ★★★
Technology ★★★★½
Verdict ★★★★
Sophisticated contact management with a new face and unique Net hooks.

Competition: Lotus Organizer offers a simple and customizable interface that may be easier to learn and use, but other PIMs and contact managers can't touch Ecco's Internet integration.

System Requirements: 386 processor, 4MB of RAM (8MB recommended), 6MB to 11MB hard disk space.

$99 est. street price
NetManage
(206) 885-4272
Reader Service No. 617

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

There are two kinds of experiences you can have setting up a mobile workforce.

Virtual headache.

Until now, automating a mobile workforce could be a painful experience.
How could you be sure everything would work together?
Or that it would work with what you've already got?
And what about your end users? They're not technicians.
When they have a problem in the field, whose problem is it?



Virtual Workplace.™

AT&T and 33 Team Virtual™ partners bring you the first goof-proof mobile workforce solution. Products and services approved by AT&T to work together. And everything is covered by AT&T's unique one-stop support and remote diagnostics.


Communications Products


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Go virtual now and get something very real. A year of free HelpDesk.

Buy an AT&T Virtual Workplace™ Solution by December 31, 1995 and get a whole year of HelpDesk free (a $249 value). With HelpDesk, your workforce can call a single toll-free number for help with any approved part of their Virtual Workplace Solution. Anytime, day or night. Any day of the year. From anywhere.

Please help us get to know you better, by completing the information below. Or call us at 1 800 447-1124, ext. 1161.

Name_____ Title_____

Company_____ Address_____

City_____ State_____ Zip_____

Phone_____ Fax_____ E-mail_____

This project is for: ☐ Corporate deployment ☐ Departmental deployment (Which dept? _____) ☐ Small team/individuals

Is this project in your budget? ☐ Yes ☐ No

How big is your mobile workforce? ☐ Up to 49 ☐ 50-99 ☐ 100-250 ☐ 250+

When do you plan to automate your workforce? ☐ Now ☐ 3-6 months ☐ 6 months-1 year

☐ Please have an AT&T Customer Focused Team call me.

☐ Please send me more information about AT&T Virtual Workplace Solutions.

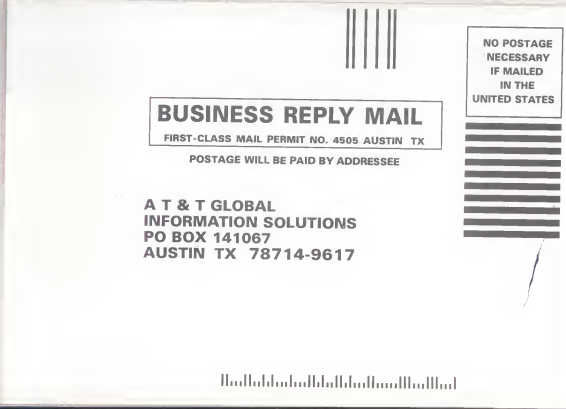
AT&T Global Information Solutions

PCC 10/95

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Virtual headache.

Until now, automating a mobile workforce could be a painful experience.
How could you be sure everything would work together?
Or that it would work with what you've already got?
And what about your end users? They're not technicians.
When they have a problem in the field, whose problem is it?



intel inside
pentium

Virtual Workplace.™

AT&T and 33 Team Virtual™ partners bring you the first goof-proof mobile workforce solution. Products and services approved by AT&T to work together. And everything is covered by AT&T's unique one-stop support and remote diagnostics.



Communications Products | Computing Products | Software Solutions | Communications Services | Single Source Support

AT&T Virtual Workplace Solution

Featuring the AT&T Globalyst™ 255 Notebook.

ee next page for more on Team Virtual partners.

For full details, call 1 800 447-1124, ext. 1161.

Bringing computing and communications together to help you get, move and use information.

GET IT MOVE IT USE IT

AT&T Global Information Solutions

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Samsonite

Adaptive Strategies, Inc.

LOGITECH

Stac

AT&T Global Information Solutions

CITIZEN

intel inside pentium

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Perfectly Simple Page Layout

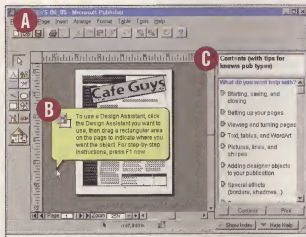
SNEAK PREVIEW

We were wrong. Several months ago, when we compared desktop publishing programs in our Usability Labs (see "Perfect Pages Made Easy," July, page 164), we didn't think desktop publishing could get any easier than Microsoft's Publisher 2.0. Well, guess again. The Windows 95 version of Publisher ups the usability ante so that anybody can create professional-looking documents.

From the onset, you'll notice that Publisher 95 is even easier to use than version 2.0. Upon start-up, you have only three choices for your document: New Publication, Blank Page, or Existing Publication. The Templates Startup option in 2.0 has been integrated into the wizard-based New Publication menu, so you no longer have to ponder the philosophical differences between templates and wizards.

The number of document categories remains about the same, but more variety has been added to each. Newsletter styles, for example, have jumped from 5 to 12. Select a style, and a Page Wizard creates the document for you, pausing to ask for your preferences on headline text, number of columns, and other variables.

Help Is on the Way Publisher 95 dishes up several levels of help, so you're never left wondering what to do next. The Cue Cards (pop-up help windows) in version 2.0 have given way to step-by-step help instructions integrated into the desktop so that they don't overlap onto your workspace. Tip pages, new context-sensitive text balloons, offer unobtrusive hints and warnings as you try new features for the first time.



Publish Like a Pro: Microsoft Publisher for Windows 95 makes it easy to create great-looking documents—and you get plenty of help along the way. Step-by-step Help options are now located on the desktop so they won't clutter your work area the way version 2.0's Cue Cards do.

A. Microsoft Office users will recognize Publisher's new **toolbar.**

B. Context-sensitive **tip pages** help you out of jams and offer suggestions for simplifying tasks.

C. The new step-by-step **help** is integrated with Publisher's work space.



Color Prints: If you're using a color printer, Windows 95's Image Color Matching profile will mark the colors that don't print well.

Of course, you'll still find Publisher's original Wizards. And in addition to the Startup Wizards, Publisher 95 also retains Design Assistants, which help you create custom calendars, advertisements, and coupons.

Designing Documents Publisher 95's new Design Gallery lets you choose unique combinations of page elements that are stylistically consistent. Organized into page-element categories like mastheads, headlines, pull quotes, and sidebars, the choices within each category are labeled to indicate their relationships to items in other categories.

If you choose a consistent style from different categories, your design should reflect that consistency. Because you can also choose between jazzy, modern, and plain designs in each category, the number of permutations is enormous, so it's easy enough to create documents that don't scream Microsoft Publisher.

Microsoft pays similar attention to helping you choose tasteful color combinations. Choosing a spot color and color proofing is painless. Special PostScript drivers, which are tested for compatibility with industry-standard, high-resolution image setters, make the trip to your professional service bureau or printer much more predictable.

Whether you're a longtime Publisher user or you just need a quick and easy way to dress up documents for the home or office, Microsoft's Publisher for Windows 95 is a first-class addition to any hard drive. **BOB WEIBEL**

FILEBOX

Publisher for Windows 95

Usability *****
Technology ****
Verdict ****½

The easiest way to produce professional-looking documents on your PC.

Competition: Publisher remains the clear leader of entry-level publishing applications like Serif's PagePlus and New England Business Service's Page Magic. It's also the first entry-level publisher for Windows 95.

Minimum System Requirements: 386 processor, 6MB of RAM, 6MB of hard disk space, Windows 95.

Ease-of-Use Features: Page Wizards step you through the process of creating common documents in more than 100 publication styles. Tip pages offer subtle hints and shortcuts for using new features. Step-by-step help remains onscreen as long as you need it.

$80 est. street price for disk or CD-ROM Deluxe version (CD-ROM includes additional fonts, clip art, and borders).
Microsoft Corp.
(800) 426-9400
Reader Service No. 615

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Publishing in Graphic Detail

SNEAK PREVIEW

If you're a professional publisher and plan to make the switch to Windows 95, you may think you'll risk leaving your desktop-publishing power behind. Don't worry: Adobe is stepping up to the plate with a 32-bit version of PageMaker.

It has been more than two years since the last upgrade, and in most ways it's been worth the wait. PageMaker 6.0 offers tools for creating Acrobat-compatible PDF documents that can be viewed and printed by people who may not have the software or fonts used to create them. In addition, you'll find a plug-in HTML author that will help you get your pages up on the Internet.

Live Pages You say you want a home page on the World Wide Web, but haven't got a clue how to create one? Let PageMaker do it for you. Even if you don't know how to create hypertext links, PageMaker's built-in HTML editor makes it easy: Just add keywords to your document's index or table of contents, and within seconds they're linked.

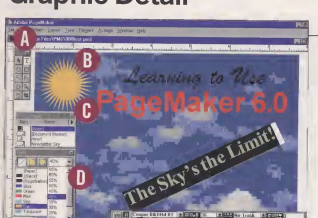
Most users will still want traditional hard-copy output, however, and PageMaker 6.0 offers improvements there as well. Adobe has made its PostScript code more efficient, resulting in smaller EPS files. Other time-savers include multiple printer profiles—allowing you to save definitions for both proofing and final output devices—and reader's spreads (pairing pages onscreen as they will be read rather than printed).

PageMaker 6.0 now supports Adobe's Photoshop-compatible plug-in filters and allows you to correct Kodak's Photo CD images from within a PageMaker document. It also does RGB-to-CMYK image conversion so you can convert and separate TIFF images from within PageMaker. Expanded Pantone color libraries, integrated automatic trapping, and object-level tints make working with color much easier.

Usability Catch-up As impressive as these high-end features may be, however, PageMaker 6.0 lacks innovation in usability. Many of the enhancements are merely subtle changes, such as added keyboard shortcuts and snappier graphics-handling performance. Multiple master pages, group and align commands, a variable zoom tool, and nonprinting objects are improvements users expected long ago.

PageMaker's new Scripts palette lets you create shortcuts to frequently used features. Other functions, such as the new polygon tool for creating stars and regular polygons, are of dubious value. Most disappointing, though, is the lack of long-hoped-for features like multiple levels of undo, context-sensitive right-mouse-button menus, and a more robust spell-checker.

Nonetheless, veteran PageMaker users will appreciate the step up to 32-bit performance. PageMaker remains an effective, relatively easy-to-learn business tool, and the addition of professional image-editing and output functions will please longtime users. But interface quirks and missing features don't give QuarkXPress users a compelling reason to switch. **MARTY BEAUDET**



Publishing 95: Way overdue, the newest version of PageMaker debuts under Windows 95. PageMaker's interface remains largely unchanged. Two new items on the tool palette, an expanded Colors palette, and a new Master Pages palette are the few signs of an upgrade.

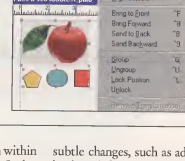
A. New **zoom and polygon** tools on the tool palette.

B. Create **polygons** like this sunburst.

C. Define multiple-page templates from the **new Master Pages** palette.

D. Tints of **spot color** may now be assigned to text and objects.

Making Arrangements: The new Arrange option offers object alignment and grouping long found in competing applications.



FILEBOX

PageMaker 6.0

Usability ★★★
Technology ★★★★
Verdict ★★★★

Good professional image handling and output, but a few remaining interface quirks.

Competition: QuarkXPress and Corel's Ventura, although neither is yet available in a 32-bit Windows 95 version.

System Requirements: Windows 95 use requires 486 processor, 8MB of RAM (4MB available for PageMaker); Windows 3.1 use requires 486 processor, 10MB of RAM, and DOS 5.0. Both configurations require 20MB of hard disk space and a high-density disk drive.

New Features: HTML authoring tool lets you create Web pages; integrated image-editing tools save time; and Kodak Precision Color Management System support ensures device-independent color fidelity.

$525 est. street price, $149 for upgrade from previous versions.
Adobe Systems
(800) 642-3623
Reader Service No. 618

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

You're ready to make the move to Microsoft's new 32-bit Windows 95 operating system. The most powerful PC operating system you've ever experienced. But before you do, upgrade your utilities to Norton Utilities® for Windows 95.



NORTON UTILITIES PROVIDES THE ONLY AUTOMATIC DATA RECOVERY AND CONTINUOUS SYSTEM PROTECTION FOR WINDOWS 95.

IT'S A 32-BIT WORLD OUT THERE.

You already know Norton Utilities is the best set of tools for system protection, hard disk optimization and data recovery.

What you may not realize is that your current 16-bit utilities won't run under Windows 95.

And the simple utilities found in Windows 95 itself don't offer sufficient data protection for life in a 32-bit world.

Which is why you need the new Norton Utilities for Windows 95.

The first thing Norton Utilities for Windows 95 will do for you is tune up your system for Windows 95 by optimizing your hard drive and cleaning out all of the files you no longer need.

Then Norton Utilities runs in the background, monitoring your system and automatically launching tools to maintain system performance and prevent system crashes.

Of course, if your system does crash or you accidentally erase a file, Norton Utilities for Windows 95 gives you the data recovery tools users have relied on from day one.

Even if other applications crash, Norton Utilities for Windows 95 keeps running to help you recover.

That's the beauty of our native, 32-bit utilities. No other utilities can give you this kind of continuous, real-time protection and data recovery in the brave new world of Windows 95.

NORTON UTILITIES FOR WINDOWS 95

PRE-INSTALLATION TUNE-UP
Frees up disk space and provides a comprehensive pre-installation physical.

NORTON SYSTEM DOCTOR
Continuously monitors all vital resources and data integrity. Alerts you to impending disaster and recommends action or fixes problems automatically.

NORTON DISK DOCTOR®
Automatically diagnoses and repairs file system problems using the speed and safety of 32-bit technology.

UNERASE®
100% protection of erased files. The new wizard-like interface leads you through file recovery step by step.

SYSTEM INFORMATION
Diagnoses potential conflicts and configuration problems with detailed system information and performance testing.

NORTON SPEED DISK™
Automatically optimizes drives and reduces future fragmentation using 32-bit technology.



PROTECT YOUR DATA FROM DAY ONE.

And like every software product from Symantec, Norton Utilities for Windows 95 comes with a full sixty-day money-back guarantee.

So you've got nothing to lose. Except your data. Get your trade-up edition of Norton Utilities for Windows 95 today.

If you own Norton Utilities, Norton Desktop for Windows or PC Tools, get your $59.95 trade-up edition of Norton Utilities for Windows 95 today. To purchase, visit your software store or call us at 1-800-450-9760, ext. 9332.*



FROM DAY ONE
NORTON
FOR WINDOWS 95

SYMANTEC.

**Trade-up offerings will run only when specified Symantec and Central Point products are already installed. Check with your software store for qualifying versions. Price does not include shipping & handling or any applicable sales tax. Symantec, Norton Utilities, Norton Disk Doctor and UnErase are registered trademarks and Speed Disk is a trademark of Symantec. All other brand names or trademarks are the property of their respective owners. ©1995 Symantec Corporation. All rights reserved. Terms are the learner at http://www.symantec.com In Canada, call 1-800-365-4641. In Australia, call 2-879-6577. In Europe, call 31-71-353111*

Circle 208 on reader service card.

Globalyst S40, Prioris HX 590, NetServer 5/100 LH

Industrial-strength Servers

It doesn't take breaks, it doesn't complain, and it never asks for a raise. No, it's not a non-union, android worker—it's your server. We're not talking about a garden-variety 486 or Pentium that you throw in a closet, but an honest-to-goodness, industrial-strength machine designed to process endless transactions for several months—or even years—without failure.

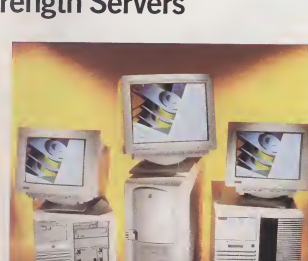
If you're looking for this type of nonstop workhorse, consider AT&T's Globalyst S40, Digital Equipment's Prioris HX 590, and Hewlett-Packard's NetServer 5/100 LH. For our tests, all three servers were configured with 128MB of RAM, at least 4GB of hard disk space, 10Base-T Ethernet network adapters, and Novell NetWare 4.1.

Tireless Powerhouse

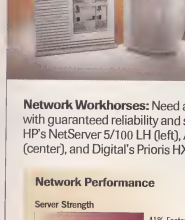
HP's NetServer 5/100 LH easily met our requirements with its dual Adaptec PCI SCSI controllers, four 1GB Seagate ST21230 SCSI drives, and a Cogent four-port 10Base-T Ethernet controller. As you'd expect, the hard drives are hot-swappable, and can be configured with RAID Levels 0, 1, 5, or 6. (RAID Level 6 offers the best of both worlds, because it delivers top performance as well as the security of redundancy.)

HP's new NetServer 5/100 LH continues the tradition of cutting-edge technology and ease of use that HP has established in the server realm. For starters, it houses up to 192MB of RAM. Sound like overkill? Well, the NetServer isn't just a file server: With an option to add a second 100MHz Pentium processor, the same system can easily serve as an application server (write-back cache is doubled to 512K and shared between the processors). In our performance tests, the NetServer was consistently strong, showing no signs of fatigue even under heavy loads. Setting up this powerhouse is simple with HP's NetServer Navigator bootable CD-ROM. This single CD lets you monitor disk controllers, hard disks, and RAM; and it contains OpenView for Windows, HP's network management software. OpenView is quickly becoming an industry leader in the server arena and can be used to manage your entire network—not just HP hardware. We found all the utilities on the disc to be powerful and easy to master.

Like HP's NetServer 5/100 LH, AT&T's Globalyst S40 is powered by a 100MHz



Network Workhorses: Need a mission-critical server with guaranteed reliability and speedy performance? HP's NetServer 5/100 LH (left), AT&T's Globalyst S40 (center), and Digital's Prioris HX 590 (right) fit the bill.



Net Gain: Servers from Digital and HP raced to a photo finish in NetBench, our server performance test.

FILEBOX

Globalyst S40

Usability ★★★
Performance ★★★
Technology ★★★★
Verdict ★★★½

A pricey but capable workgroup telephony server.

Optional: SCSI-2 PCI RAID controller.

$23,765 est. street price
AT&T Global Information Systems
(800) 637-2600
Reader Service No. 623

Prioris HX 590

Usability ★★★½
Performance ★★★★½
Technology ★★★½
Verdict ★★★★

Impressive server performance under very heavy loads.

Optional: Multichannel PCI or EISA RAID controller.

$17,900 est. street price
Digital Equipment Corp.
(800) 344-4825
Reader Service No. 624

NetServer 5/100 LH

Usability ★★★★½
Performance ★★★★½
Technology ★★★★½
Verdict ★★★★½

Top-notch 100MHz server performance and a breeze to set up and manage.

Optional: EISA Fast SCSI-2 RAID controller.

$15,226 est. street price
Hewlett-Packard
(800) 322-4772
Reader Service No. 625

PHOTOGRAPH BY ARNOLD TOSCIO

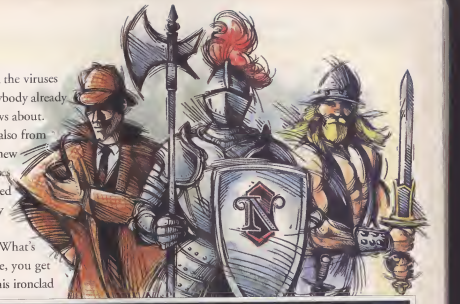
Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Windows 95 is here. And it's really terrific.

Except for one thing: it doesn't include any anti-virus protection. And your old anti-virus software won't work in Windows 95 either. But thousands of old viruses will.

So that leaves you with a choice. Do nothing and hope you never come across an infected floppy or download an infected file. Or buy a new anti-virus software product that can work in this new environment.

But which anti-virus product should you buy? Norton AntiVirus® for Windows 95.



DETECTION, PREVENTION, DESTRUCTION. IF YOUR ANTI-VIRUS SOFTWARE DOESN'T HAVE ALL THREE, YOU'LL BE COMPLETELY EXPOSED TO VIRUSES IN WINDOWS 95.

NCSA CERTIFIED SO YOU CAN REST EASY.

Norton AntiVirus for Windows 95 is NCSA certified to detect 100% of the viruses found in circulation. And recent independent tests* conclusively demonstrate that Norton AntiVirus for Windows 95 detects and destroys as many or more known viruses as any other anti-virus product around. But our virus protection doesn't stop there. Norton AntiVirus for Windows 95 also protects you from new, unknown viruses. Thanks to a unique virus detection technology that allows us to spot any suspicious activity, no matter where it's lurking.

So your system is safe. Not just from the viruses everybody already knows about. But also from the new viruses created every day.

What's more, you get all this ironclad protection without a host of long annoying disruptions to your work.

Because Norton AntiVirus for Windows 95 scans files fast. Even compressed files.

And Norton AntiVirus works in the background, continuously monitoring file access and usage. So it can stop viruses in their tracks. Which means you don't have to worry every time you put a floppy in your disk drive.

Designed for Microsoft® Windows 95

THE NO RISK ANTI-VIRUS SOLUTION.

Needless to say, Norton AntiVirus for Windows 95 comes with our standard sixty-day money-back guarantee.

So why gamble on running Windows 95 without complete virus protection? Get your trade-up edition of Norton AntiVirus for Windows 95 today.

NORTON ANTIVIRUS FOR WINDOWS 95

WINDOWS 95 COMPLIANT
Full 32-bit application. Supports long file names and Universal Naming Conventions.

AUTOMATIC BACKGROUND MONITORING
Virtual device driver unobtrusively checks for viruses in the background. Ensures backups and files transferred are virus-free.

FAST SCANNING
Provides ironclad virus protection without affecting productivity. Scans even compressed files fast.

EXCLUSIVE VIRUS SENSOR
Provides continuous, transparent protection against new, unknown viruses.

NCSA CERTIFIED
Detects 100% of viruses found in circulation.

TRADE-UP EDITION NOW ON SALE.

*If you own Norton AntiVirus, Central Point Anti-Virus, Norton Desktop for Windows, or PC Tools, get your $29.95 trade-up edition** of Norton AntiVirus for Windows 95 today. McAfee VirusScan and Dr. Solomon's Anti-Virus owners also eligible. To purchase, visit your software store or call us at 1-800-450-9760 ext. 9333.*







SYMANTEC.

*Independent tests conducted by NCSA and VSUM, July 1995. **Trade-up editions will run only where certified Symantec, Central Point, McAfee or Dr. Solomon's products are already installed. Check with your software store for qualifying versions. Price does not include shipping & handling or any applicable sales tax. Symantec and Norton AntiVirus are registered trademarks of Symantec Corporation. All other brand names or trademarks are the property of their respective owners. ©1995 Symantec Corporation. All rights reserved. Visit us on the Internet at http://www.symantec.com In Canada, call 1-800-365-8641 In Australia, call 2-879-1577 In Europe, call 31-71-535111

Circle 209 on reader service card.

Pentium. Other similarities include multiprocessing architecture—although AT&T offers up to four 100MHz or 133MHz Pentiums—and a built-in SCSI drive. And with 1MB of cache for each processor, the Globalyst S40 quickly converts to a no-compromise application server as well.

For your storage needs, the Globalyst S40 has three Seagate 32550we 2GB drives that run off a fast-wide SCSI controller. To protect against crashes, the storage system can be configured with RAID Levels 0, 1, or 5. And the drives are all mounted in hot-pluggable bays, thus letting you replace a drive without bringing down the entire server.

The Globalyst S40's Ethernet cards were mixed with two SMC PCI cards and two 3Com Etherlink III EISA cards. Unfortunately, these gee-whiz components didn't translate into stellar performance; the Globalyst S40 placed last in our tests, running nearly 40 percent slower than the leaders.

But when it comes to communications, the Globalyst has unique features only AT&T could deliver, including PassageWay Telephony Services (PTS), a joint venture of AT&T and Novell. PTS is designed to meld your phones and computer into a single unit, making it easy to track calls and use advanced telephony features such as caller identification. And with AT&T's Vistium Share software, you can collaborate in real time with just about any Windows software application.

All the telephony apps are based on the Telephony Services Application Programmer's Interface, (TSAPI) that was jointly developed by AT&T and Novell. The bottom line: If large-scale telephony is in your future, look to AT&T's Globalyst S40 as a complete solution with plenty of room for growth.

PICKS NETWORK SERVERS

Future-looking server with integrated telephony and communications	Globalyst S40
Heavy transaction capabilities and remote server-management add-in card	Prioris HX 590
Power-packed performance, with application-server capabilities	NetServer 5/100 LH

Different Servers, Different Scenarios: One size does *not* fit all, so choose a server that best fits your needs: AT&T's Globalyst S40 has telephony integration that lets you marry your phones to your network; HP's NetServer 5/100 LH offers screaming network performance and can be upgraded to work as an application server; Digital's Prioris HX 590 won't back down under heavy loads and includes an add-in card that makes for easy management and remote control.

Extremely Digital With the Prioris HX 590, Digital focuses on performance and reliability, illustrating that if you get these two right, you're guaranteed a winner. And while many of the Prioris's features aren't unique, Digital took each to the extreme and came up with a great mix.

Powered by a 90MHz Pentium, the Prioris houses up to 256MB of RAM. Our test unit came with a 512K burst-mode cache, a Mylex DAC960 RAID disk controller, and four digital RZ261 fast-wide hot-swappable SCSI drives. Combine that with redundant power supplies, and you have unmatched reliability. And should your applications require the ultimate in disk performance, you can add up to 4MB of cache to the RAID disk controller.

For network communications, Digital supplies four Etherworks turbo PCI combo controllers. But it doesn't stop there. If your plans include several servers, the Prioris mounts easily in Digital's rackmount system. Up to four of these powerhouses fit into a single cabinet.

As our network tests progressed and the load increased, the Prioris didn't falter. Even at the peak load, there were no signs of a slowdown.

To ease the burden on your information systems department, Digital provides an add-in server-management card that records all environmental variables, server information, and allows remote control of the system. You can even power the system off and back on remotely, and watch the boot process. Also included with the Prioris HX 590 is a copy of QA Plus FE for system diagnostics and a setup CD that contains software drivers for all of the supported operating systems. The CD is helpful, but the interface needs a little work—we found it to be overly confusing for what should be simple network-management tasks.

Server at Your Service Loading up NetWare and locking a computer in a closet doesn't make it a server. It might work for a small, peer-to-peer setup, but for mission-critical setup, you'll want to start with a real server. Look for a fast system bus architecture like EISA or PCI, a reliable disk subsystem with RAID, and error-correcting memory via ECC or parity, all of which should be backed by at least a three-year, onsite warranty. All three systems we looked at are backed by these essentials.

Likewise, don't settle for just a file server. Based on this group, you should be able to find a server that's well suited for applications and files—and that scales to meet your needs. That means that all of your servers, regardless of how they're configured, can come from one source—a key consideration for network management and maintenance.

That said, HP's NetServer 5/100 LH, AT&T's Globalyst S40, and Digital's Prioris HX 590 all meet these basic requirements. For heavy-duty network transactions, choose the unmatched performance of HP's NetServer 5/100 LH or Digital's Prioris HX 590. And for telephony and communications integration on a network, why build it yourself? AT&T's innovative Globalyst S40 can computerize your phone system for you. ADAM MEYERSON

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

THE TOP 10 REASONS WHY NORTON NAVIGATOR USERS WORK FASTER IN WINDOWS 95.

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5. Try a word search for "profits" or any other text string within files. It's at least ten times faster on average with Norton Navigator. No matter how many files you have. Or how big they are. In fact, the bigger the files, the more time you'll save.



6. Save another minute every time you delete, move, zip, or encrypt from any application's Open or Save dialog box. (Are you keeping count?)

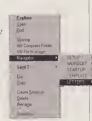


9. With Norton Navigator, you can create a different desktop for each project. So you can find your work more easily. And save even more time.

10. Windows 95 supports long file names for all of your new 32-bit applications. Norton Navigator supports long file names for most 16-bit applications, too. So you'll never again have to remember what "billgbox" means.

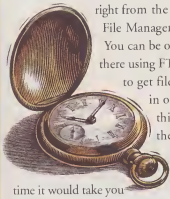
Mission accomplished. One step.

2. Opening a folder in Windows 95 takes a full five clicks of your trusty mouse. But with Norton Navigator, you can open any folder with just one simple click.



3. Compress a file. Our built-in PKZip compatible compression saves you a minute every time.

4. Use Norton Navigator to plug into your Internet connection right from the File Manager. You can be out there using FTP to get files in one third the time it would take you with a separate application.



7. One click is all it takes to access recently opened files or folders from any application. Now isn't that better than wading through folders?

8. Launch your favorite files, folders, or applications simply by pushing a button on the Norton Taskbar. No more going up and down to and from the Start menu over and over again.

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Norton Taskbar features multiple desktops that let you organize your files and find your work faster.

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SAMSUNG

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Logbook LONG-TERM TESTS:
Phaser 340 • Acrobat Reader 2.0



Color Me Quick

I never used to mind waiting for color. I thought my first color ink jet was perfect, even though the paper was so soggy you could wring the ink out of it and pages took several minutes to emerge. Then came thermal-wax color (too blurry for my liking) and dye-sublimation (so expensive I couldn't think of occasions special enough to use it). So when I saw my first phase-change color printer—Tektronix's Phaser III PXi—I thought it couldn't get much better. Who cares if it took several minutes to produce a page and the wax chipped and faded over time? As long as I could always get my output to look good, I was satisfied.

Well, my standards have changed now that I use Tektronix's Phaser 340 printer, the follow-up to the Phaser III PXi. It sits on my desk—where I can guard it like a jealous lover. Wait for color? Not anymore. The Phaser 340's 4-ppm engine spits out even heavy-duty color pages in seconds, making it an ideal network printer. And forget about getting wax under your fingernails. My color documents no longer have that embossed feel, thanks to a much thinner layer of wax on the page. Pages I printed six months ago show no signs of fading, either.

The Phaser 340 not only changed my work style, but it made a serious impression on my coworkers. Tables and charts come alive with color, and printed screen shots and images look close to how they'll appear in the pages of this magazine. How did I ever print without it? **MARTY BEAUDET**

Phaser 340 / Tektronix / (800) 835-6100 / $4,995 list / *Reader Service No. 666*

Logbook Entries:

February 6, 1995: *Couldn't be much easier to set up. The maintenance tray fits neatly into the front opening. I flip the top open and drop the four crayons into their respective slots. Because of their distinctive shapes, it's impossible to mix up which color goes where. The Windows driver setup is simple, too.*

May 19, 1995: *The display tells me the waste tray is full. Curiously, I find very little residual wax, but I empty it anyway. The tray is flimsy—as if it should be disposable—but seems perfectly good, so I put it back. All is well.*

July 26, 1995: *Faint streaks begin to run the length of every page. I discover the Clean button, and the problem is quickly resolved.*

Logbook Entries:

April 17, 1995: *Sadly, it's tax day. I know the Internal Revenue Service distributes tax forms online, but why not in Adobe Acrobat format? Then I could do a quick search for "refund amount." How better to speed up and ease data exchange?*

June 26, 1995: *It's nice to be safe. Acrobat includes several security features, including the option to use two passwords to open a document. Documents can also be designated read-only, and I can disable all printing and copying capabilities.*

August 18, 1995: *Acrobat offers the Distiller, which converts any PostScript file into PDF format. Now I can dabble in portable document publishing.*



Online Acrobatics

My friend Tracy handles art production for a music magazine. Last spring, she sent me e-mail with some of her work attached. The problem: She uses a Macintosh; I run Windows. Why can't we all just get along? With Acrobat Reader 2.0 Portable Document Format (PDF), we most certainly can.

I love Adobe's Acrobat. It's efficient, comes in a variety of flavors, and the price is right. About a year ago, Adobe wised up and started giving away Acrobat Reader 2.0 free. I personally don't use Acrobat for publishing, but with Reader 2.0, I can enjoy Acrobat files exactly as the creator intended.

With full-text search capabilities, including words in PostScript graphics, Acrobat turns otherwise static documents into mini-encyclopedias. For example, I can quickly search for Bob Marley's birthday in my history-of-reggae document, or find the address for the University of Delaware in my East Coast colleges file.

The other big plus? It's Internet savvy. Adobe secured a deal with Netscape Communications to include Acrobat in the next version of Netscape's Navigator (the best Web browser around). Compared to Acrobat documents, pages created in HTML-format look downright ugly. Other online services are getting in on the act as well, including Profound, which uses Acrobat to distribute information.

The current version works fine under Windows 95. Try it by downloading a free viewer from PC Contact, our CompuServe forum (see instructions on page 532), or from Adobe (http://www.adobe.com/). You'll do flips. **RICH SCHWERIN**

Acrobat Reader 2.0 / Adobe Systems / (800) 833-6687 / Free reader software, publishing software available, prices vary / *Reader Service No. 667*

PHOTOGRAPHY BY ARNOLD TOSKI/O



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on Lotus Freelance Graphics,



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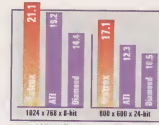
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*Estimated street/estimated selling price for the 2 MB version.**Multimedia Super Pack available in MGA Millennium retail packaging only. Windows 95 tests (business) conducted by Matrox Graphics Inc. using WinBench 95 (Ziff-Davis) on a Pentium 90 computer with RAM cache. WinMark at 1024 x 768 in 256 colors (large fonts) and 800 x 600 in 15.7 million colors (small fonts): 72 hz. Per Matrox MGA Millennium 1 MB WRAM/ Stealth 64 Video and ATI Graphics Pro Turbo versions configured with 2 MB of memory (as the PC Bus using driver versions 2.05.00, 1.20.03 and 4.10.03 respectively.

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Windows 95 SUPERGUIDE



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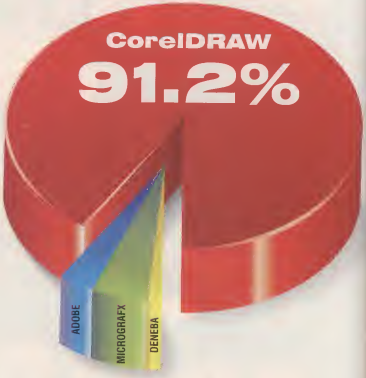
THE OVERWHELMING CHOICE OF PC USERS!

#1

Market Share
Windows Illustration Software
PC Data,
December Sales, 1994

CorelDRAW
NUMBER ONE in ILLUSTRATION

Company	Units	Sales
Corel	7,609	1,586,519.83
Adobe	257	73,968.64
Micrografx	380	36,696.38
Deneba	98	15,899.24
Totals	8,344	1,713,083.90



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#1

**Corel VENTURA*
NUMBER ONE in PUBLISHING**

Product	S.L.P. (US$)	Score
Corel VENTURA 5	$595	6.8
QuarkXPress	$895	6.7
Aldus PageMaker	$895	6.2

3.5" disk version

INFOWORLD
Report Card Rating,
Desktop Publishing Software
March 20, 1995

#1

**Corel PHOTO-PAINT*
NUMBER ONE in IMAGE-EDITING**

Product	S.L.P. (US$)	Overall weighted score
Corel PHOTO-PAINT 5 Plus	$249	44
Micrografx Picture Publisher 5.0	$595	42
Adobe PhotoShop 3.0	$895	39
Fractal Design Painter 3	$499	38

3.5" disk version

PC World,
Best Buy Award,
April, 1995

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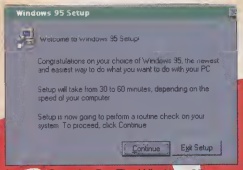
Power Up Windows 95

Windows 95 is an operating system for the masses. But who wants to be one of the masses? Those cheery Wizards and dumbed-down help screens are great for new users, but they just slow down the rest of us.

For the fourth edition of *PC Computing*'s Windows Superguide, our staff of Windows 95 experts zeroed in on nine crucial areas—from the subtleties of setup to the fine points of multimedia and mobile computing. We distilled a year's worth of Windows 95 experience into 33 pages of essential information guaranteed to increase your productivity.



Welcome to Windows 95: The CD has games, multimedia tidbits, and other utilities not found on the floppy disks.



Ready, Steady, Go: The Windows 95 Setup Wizard takes you through all the steps to get you up and running.

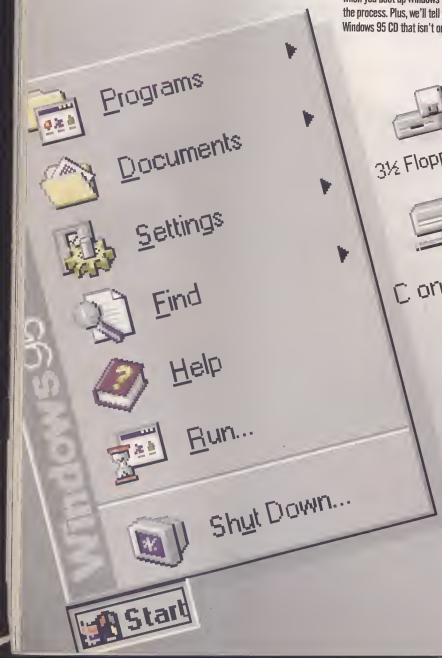
We collected the most useful tips—including a selection of undocumented Windows 95 secrets—and provide step-by-step instructions for incorporating them into your PC. In each section, you'll find a Guided Tour of the new interface. If you have only a few minutes, check out the Quick Results box at the beginning of each section for some instantly usable advice.

Training wheels? Who needs 'em? We'll see you in the fast lane.

Windows 95 Superguide

You've probably read enough about what Windows 95 can do. Now it's time to actually do it yourself. To get you started, we've organized hundreds of useful Windows 95 tips and tricks into ten bite-size chapters. Whether you want to learn about managing files, boosting network performance, or deciphering the Briefcase, we'll help you find faster, smarter ways to make Windows 95 work for you. It's time to start.

Setup and Start-up: Find out what happens when you boot up Windows 95, and what you can do to control the process. Plus, we'll tell you what Microsoft includes on the Windows 95 CD that isn't on the floppy disks. **142**



Organizing Files: Although Windows 95's cascading menus let novices dive right in, they can quickly get in the way. Here are some backdoor methods for sidestepping the clutter and getting right to your most-used applications and documents. **146**

Managing Files: The new Explorer replaces File Manager—and beats it hands down. We'll show you how to create custom views so you can get the most from this new utility. **150**



Performance Power: Don't touch that swap file! Windows 95 handles caching differently than Windows 3.*x*, so you need to unlearn the old tricks and learn a few new ones, like how to create shortcuts that will speed up your work. **162**

My Computer





Fonts



Printers

Multimedia

Practical Multimedia: Windows 95 was built for multimedia, but its default installation may not include everything you need. We give you tips that let you enhance your multimedia capabilities. **174**

Printing and Fonts: Setting up your printer under Windows 95 is much easier, thanks to Plug and Play. But choosing the right font for your newsletter can still be tough. We'll show you how the operating system can help you decide. **166**

Communications: With Microsoft Exchange, you can connect to the world any number of ways. We'll tell you how to consolidate your faxes and CompuServe and Internet mail in a single place. **182**



Modems



Network Neighborhood

Networking Smarts: Install the right drivers and you can increase your network-access speed by as much as 200 percent. Plus, here's how to manage printers from afar. **178**



Mobile Computing: If you have Windows 95 loaded on your notebook, we'll show you how to deal with flaky PC Cards, save time on remote-access dial-ins, and use Briefcase for those critical backups. **186**

My Briefcase



Undocumented Secrets: Want to add a cascading list of control panels to your Start menu? Or customize a list of new document types? You won't find these tricks in the manual. **196**

Setup and Start-up



Setting up Windows 95 is deceptively simple. The Plug and Play hardware detection routines should track down virtually all of the pieces of your system and install the correct drivers, while the rest of the process is driven almost completely by Wizards. Based on our experience, it shouldn't take much more than an hour to set up Windows 95, and it can take significantly less time if you know what you're doing. But that doesn't mean the process is perfect. The Windows 95 setup defaults leave out some useful files, and some options are deliberately turned off to minimize calls to Microsoft's technical support. Once you've finished the Windows 95 setup routine, you'll still have some loose ends to tie up.

And what happens after that, when you boot Windows 95? Actually, it's not that different from what happens when you boot DOS 6.*x* and start replacing its real-mode pieces with the 32-bit chunks of Windows for Workgroups 3.11. A new version of DOS boots, any existing real-mode drivers are loaded, and then Windows 95 launches on top of that in all of its 32-bit, virtual glory.

Conceptually, at least, it's nothing new. But Windows 95's interface is dramatically different, starting with the absence of a command prompt. If you miss the text messages that announce the successful loading of real-mode device drivers, just press Esc when you see the Windows logo—you'll drop back to a character-mode screen until Windows itself is ready to run. But that's far from your only option at start-up time. Depending on who's using the PC, you can fine-tune the start-up process for speed or security.

Quick Results

- **Inventory your resources.** Right–mouse-button click on the My Computer icon and choose Properties from the shortcut menu, then click on the Device Manager tab. Look for problems (indicated by a yellow exclamation point over the device icon) or disabled devices (tagged with a red X). Highlight any trouble spots, click on the Properties button, and resolve any conflicts. Finally, click on the Print button and choose the "All devices and system summary" option.
- **Get rid of performance anxiety.** The System Properties dialog box also includes a tab for Performance. After installing Windows 95, check the display to make sure all of your I/O subsystems—the file system, virtual memory, disk compression, and PC Card drivers—are running the built-in 32-bit versions. If they're not, call the driver manufacturer(s) and find out when they'll have new versions available.
- **Keep an eye on system resources.** The best way is to install the Windows 95 System Resource Meter (you'll find it in the Start menu, under Programs, Accessories, System Tools). To have it load automatically every time you start Windows, add it to your StartUp group.
- **Finish your start-up disk.** Open the Add/Remove Programs applet in the Control Panel, click on the Startup file tab, and click on the Create Disk button. If you have crucial data (like the Windows 95 installation files) stored on a CD-ROM drive or on a network file server, be sure to update the start-up disk with the real-mode drivers you'll need to access the CD-ROM drive or network in the event of an emergency.



You can install Windows 95 over Windows 3.*x* or start from scratch with a "clean" installation.

You'll get best results if you install Windows 95 on top of your existing DOS/Windows 3.*x* setup. This strategy will help ensure that your applications have access to all the device drivers, DLLs, VxDs, INI files, and program groups they've become accustomed to. If you've stuck with standard hardware and software, the chances are excellent that Windows 95 will upgrade smoothly. If you have any oddball devices that use real-mode drivers, they should work with Windows 95 as well, but be prepared for some installation hassles.

Purists argue that occasionally installing a "clean" version of Windows is a good idea, and they're right. To a Windows system, software is like cholesterol. As you install new applications, utilities, patches, updates, and device drivers, your Windows and System directories begin to clog up with INI files, DLLs, VxDs, and other sludge. If you regularly install and uninstall Windows software, you can speed up Windows by occasionally wiping your hard disk clean and then reinstalling Windows and all your current applications.

It's a tedious job, though, and the payoff is mostly psychological. Our advice: Just upgrade.



The four main installation options each place a different set of Windows 95 components on your disk.

Each time you set up Windows, you're confronted with a set of choices: Typical, Portable, Compact, or Custom. You can

choose all the components by selecting the Custom option, but you can also fine-tune the Windows 95 defaults for the other three predefined setups. When the dialog box asks whether you want to review the list of choices that Windows has made, choose Yes. Then check the boxes for the items you want to add and uncheck those you don't need. This is the only way, for example, to install the full complement of Windows games (Solitaire, FreeCell, Hearts, and Minesweeper), plus the wallpaper files and animated pointers. And the only way to access the Online User's Guide or the Windows Tour is to explicitly tell Windows to install it.

If you choose Typical, look at the Accessibility Options and clear them if you don't need those features. If connectivity is important, add the Briefcase, Direct Cable Connection, and Dial-Up Networking options. And unless you already have a Windows 95 backup program, add the Backup applet (found in the Accessories category).

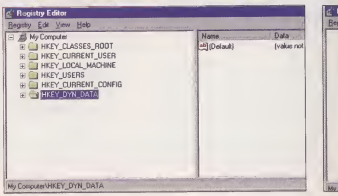
For a Portable installation, be sure to look under the Accessories entry. The next time you're sitting

SUPERTIP **Reason #95 to Own a CD-ROM**

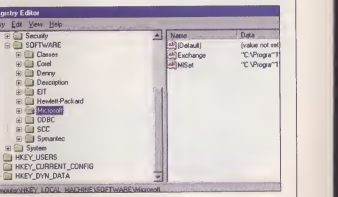
You have a choice of distribution media for Windows 95: 14 floppies with the basics or 1 CD-ROM with everything. Some of the pieces missing from the floppy version are fluff, but others found only on the CD are extremely useful, including:

- QuickView and WordView, the viewers that let you sneak a peek at files without having to open them.
- The Windows 95 Resource Kit, in a fully indexed Help file and in formatted Word files.
- The System Policy Editor, which lets you set up profiles for each user that define what they can and can't do on a given machine or on the network.
- Network Monitor and simple network management protocol (SNMP) agents, Print Agent for NetWare networks, and more network tools.
- All the MS-DOS 6.x utilities that Windows 95 Setup deletes, plus MSD, the Microsoft Diagnostics utility.
- Utilities for setting up a SLIP connection with a third-party Internet service provider (point-to-point protocol support is built in).

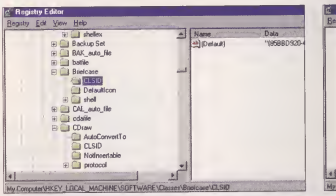
GUIDED TOUR INSIDE THE WINDOWS 95 REGISTRY



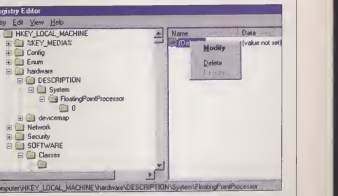
Root Keys: Registry keys work loosely like entries in Windows 3.x INI files and can have associated values.



Nested: You'll find additional subkeys under the six root HKEYS. Subkeys can be nested many levels deep.



Values: Registry values can be text strings or binary data. CLSIDs are 32-bit pointers to system objects.



Tweaking: To add, delete, or edit a Registry key or value entry, right-click on the item and choose from the menu.

in a hotel room trying to figure the day's expenses, you'll be glad you added the Calculator. And don't forget the Document Templates, which let you create new documents on the desktop with a quick right-mouse-button click.

Compact installations leave virtually every option unchecked. If hard disk space is scarce, start here. This is also the correct choice if you're ready to restore a full system backup from tape or disk immediately after you install.

And finally, be sure to browse the Windows 95 CD-ROM after you've finished Setup. The more esoteric applets and the Windows 95 Resource Kit are stored in their own directories on the CD-ROM, and the only way to add them is to hunt them down.



The Windows 95 installation files are stored in archives called CAB files. Whether you installed from the CD-ROM or from floppies, sooner or later you'll have to deal with CAB (short for Cabinet) files. These highly compressed files pack information into 2MB chunks that are roughly analogous to Zip files. CAB files can be placed on disks, but only if the disks are first formatted using Microsoft's proprietary Distribution Media Format (DMF). At present, no one has released a disk-formatting utility that can duplicate these 2MB DMF disks. Until they do, the only way to install Windows 95 without the original disks or CD-ROM is to copy the CAB files to a local or network hard drive.



The AUTOEXEC.BAT, CONFIG.SYS, and WIN.INI files are no longer required. In theory, both AUTOEXEC.BAT and CONFIG.SYS are unnecessary unless you have an unsupported piece of hardware somewhere in your system. In practice, you'll use AUTOEXEC.BAT for storing environment variables and PATH statements, but that's it.

And what about INI files? In the Windows 95 era, Microsoft discourages developers from using them. Virtually all the crucial settings in SYSTEM.INI have migrated to the Registry, as have preferences and options for most new 32-bit applications. But that doesn't mean you can eliminate them completely. Most existing 16-bit Windows applications will still insist on using private INI files and/or a section of WIN.INI. They may also check SYSTEM.INI for configuration information, even if that information is more reliably accessible via the Registry. **ED BOTT**

HOT TIP PLAY IT SAFE AT START-UP



Safety Net: What are you supposed to do when Windows 95 chokes at start-up? Use Safe Mode to begin troubleshooting. Safe Mode bypasses all start-up files, including the Registry, CONFIG.SYS, AUTOEXEC.BAT, and the [Boot] and [386Enh] sections of SYSTEM.INI.

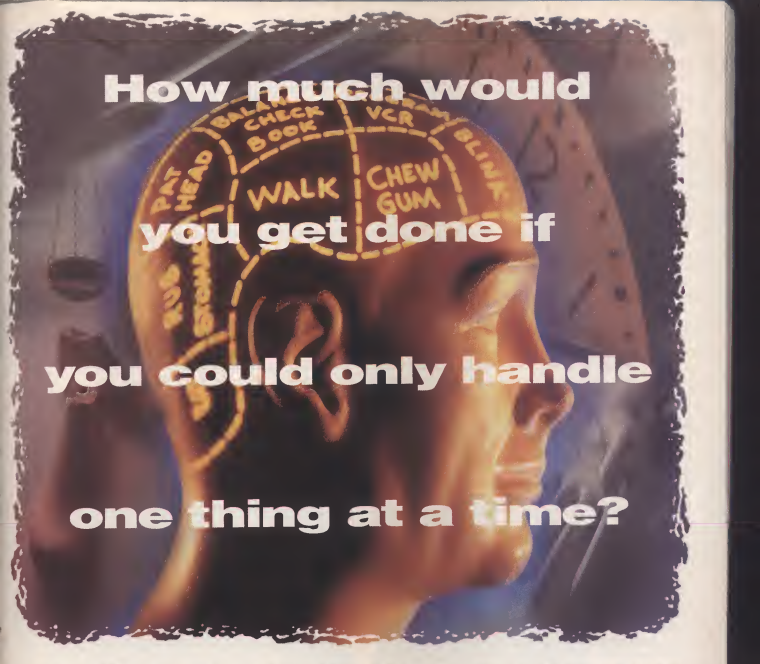
Windows 95 automatically kicks into Safe Mode if it detects that the last start-up failed. If you want to switch into Safe Mode manually, reboot your system and press F8 as soon as the "Starting Windows 95" message comes up on your screen. Safe Mode is one of the options on the Startup menu; if you're set up on a LAN you'll also have an option to switch into Safe Mode with network support.

SUPERTIP Use MSDOS.SYS to Start Smart

In Windows 95, MSDOS.SYS is a hidden, read-only text file that incorporates all of the Windows 95 start-up switches. To edit it, you'll first need to make the file visible: Open My Computer, choose View, Options, and click on the View tab, then check the radio button labeled "Show all files." Next, use Explorer to find MSDOS.SYS. Right-click on its icon and uncheck the Read-only box to temporarily change its attributes for editing. Finally, launch Notepad or another text editor and open the file. Be sure to reset the read-only attribute after you've finished.

The complete list of MSDOS.SYS switches is in the Windows 95 Resource Kit on the CD-ROM. These switches (all entered under the [Options] section) are worth learning:

- To eliminate the animated Windows 95 logo, add the line LOGO=0.
- For easier dual-booting between Windows 95 and Windows 3.*x*, add the line BootMenu=1 to automatically display the Startup menu each time you reboot, and BootMulti=1 to enable the MS-DOS option on the menu. (Of course, this assumes you preserved your DOS installation in a separate directory.) Add BootMenuDelay=*n* (where *n* is a value in seconds) to trim the 30-second delay before the default Startup menu item runs. Set the default menu choice by adding BootMenuDefault=*n* (on most systems, 3 is Windows 95).
- Finally, to prevent most users from starting up in anything other than normal Windows mode, add the line BootMenu=0.



Without a SCSI connection, true multitasking isn't possible.

In theory, if your PC is working on several things at once, productivity should skyrocket. And that's what OS/2® Warp, Windows® 95 and Windows NT™ can do. But add peripherals to the equation. Soon you'll find that an operating system alone won't let you do things like run a CD-ROM program and download Internet files at the same time.



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Organizing Files



Working smarter with Windows is all about getting organized: putting folders where you want them, filling them with the files you need, then convincing Windows to open them the way you want them opened.

If you've become used to dealing with the simple-minded Program Manager, you'll need to unlearn those old habits with Windows 95.

To start an application, double-click on an icon—an associated data file, an executable file, or a shortcut to either one. Day in and day out, you'll probably use all three techniques, but mark our words: Shortcuts are the secret to maximum productivity with Windows 95. For quick access to the files and folders you use every day, scatter shortcuts everywhere on your system: on the Start menu, on the desktop, and in the folders where you store your favorite data files.

Shortcuts occupy only a few bytes of disk space, but they do more than Program Manager icons ever could. They contain all the information you need to start a program, edit a data file, or open a folder. Some things haven't changed, though: Windows 95 still tracks the association between data files and applications by using file extensions. So when you double-click on a file, it will open by default using the latest program that grabbed that extension.

When you upgrade to Windows 95, all of your Program Manager groups migrate to the Start menu. Don't stop your customizations there, though.

Quick Results

• **Use the whole Start menu.** To bypass cascading menus, find the programs you use most often and drop each one onto the Start button. You'll get an instant shortcut at the top of the Start menu.

• **Use the desktop, too.** Why root around in My Computer constantly? Find the folders you use most often and create shortcuts for them on the desktop. Drag drive icons directly onto the desktop as well. You can use this trick for local and network drives.

• **Tune the Taskbar.** Right-mouse-button click on the Taskbar to edit its properties. If you've added a lot of items to the Start menu, you'll want to use small icons. If screen real estate is scarce, try autohiding the Taskbar. Recovering Mac users will want to drag the Taskbar to the top of the screen, plop the Recycle Bin in the lower-right corner, and drag shortcuts for their drives to the top-right corner of the desktop. Instant Mac!

• **Make folders behave properly.** By default, Windows 95 opens a new window each time you double-click on a folder. To keep window clutter down and productivity up, tell Windows to use Single Folder view instead. You'll find the option under View, Options in any folder window.

• **Choose what to see in folders.** From any folder window, including My Computer, choose View, Options. From the View tab, you can hide file extensions (annoying when you need to rename a file), hide all system files (unnecessary for anyone who understands why Windows has a System folder), and display the full MS-DOS path in the title bar (very handy when browsing across servers with similar directory trees).



You're working in your favorite application, but you want to be able to get quick access to the shortcuts and other icons on your desktop without closing the application's windows.

You can't be too rich or too thin, and you can't have too many shortcuts to your favorite places. Open the Windows folder, select the Desktop folder, and drag a shortcut into the StartUp folder. (To open the StartUp folder, right-mouse-button click on the Start button and choose Explore, then look inside the Programs folder.) For that matter, put a shortcut to My Computer in the StartUp group as well. From now on, you'll be able to use Alt-Tab to switch to open folder windows for either location. If you're concerned that you might inadvertently close either window, add shortcuts for both folders to your Start menu as well by dragging them onto the Start button.



You've scattered shortcuts to your favorite applications and data files all over your desktop, but now it's hard to get to them because the desktop is covered with open windows.

If you need to get to the desktop in a hurry, you'll need to learn the way to do it in Windows 95. Alt-Tab doesn't work, because unlike Windows 3.1's Program Manager, the desktop isn't considered a running program that you can switch to. Minimizing and restoring all those windows isn't much of a time-saving option, either. Unless, of course, you do it in a single smooth operation.

Right-click on any open space on the Taskbar (if the Taskbar is full, the clock will work just fine). From the shortcut menu, choose Minimize All Windows. Every open window will shrink down to the

Taskbar, providing unobstructed access to everything on the desktop. To put everything back where it was, right-click on the Taskbar again and choose Undo Minimize All. Note that this trick won't work properly if any of the running applications are waiting for input in a system dialog box, such as File Open or File Save.



You use a variety of applications to work with a given file type, but Windows 95 is maddeningly single-minded about double-clicking.

With a few simple tweaks, though, you can select from several applications when you open a file. The quick way to open a file with an application other than the one that's registered for that file type is to select the icon, then hold down Shift as you right-click. You'll see an extra choice—"Open with"—on the shortcut menu. Click here and Windows presents a list of the registered applications. (If the application you want isn't on the list, click on the Other button and find the executable file.)

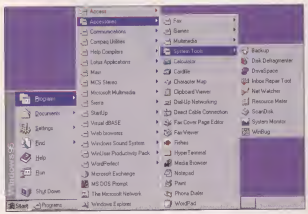
You can also permanently add a second (or third) association to a given file type. For example, you might want to associate text documents with Notepad by default, and with WordPad as a second choice on the shortcut menu. Here's how:

First, open any folder window (the My Computer folder works well). Choose View, Options and click on the File Types tab. Scroll through the list and select the file type—in this case, Text Document. Click on Edit, then click on the New button underneath the Actions list. Give this new action a friendly name, such as "Open with WordPad," and use the Browse button to fill in the full path to the executable file you want to use. For your new association to correctly handle long filenames, there's one last crucial step: At the end of the command line, add "%1" (the quotation marks are necessary). Then close all the dialog boxes and right-click on any text file to test the new association.

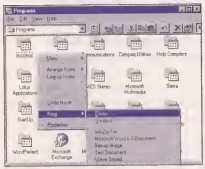
SUPERTIP **The Key to Faster Starts**

For instant access to applications, folders, and data files, associate a shortcut key with the object you want to use. You can assign a hotkey combination to shortcuts only (not to documents or executable files). Right-click on the Shortcut tab, position the insertion point in the box labeled "Shortcut key," and press the key combination you want to use. Key combinations must include an alphanumeric character and two of these three keys: Ctrl, Alt, Shift.

STEP BY STEP TUNE YOUR **START MENU** FOR BETTER PERFORMANCE



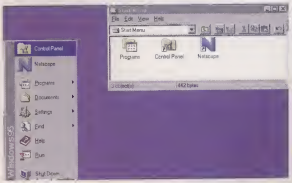
1. Cluttered Desktop: It's inevitable. The Start menu's Programs submenu will grow huge and take over your screen in no time.



2. A Place for Your Apps: Right-click on the Start button, open the Programs folder, and create a new folder in it. Copy any of your less-often used apps there.



3. A Leaner, Meaner Menu: That's much better. You should also consider using the same method to remove the clutter from the Accessories submenu.



4. Drag and Start: You can also add your favorite programs or folders to the Start menu by right-dragging their icons over the Start button.

If you need to alter the standard file extensions on a regular basis, you can also use these techniques to associate those files with the appropriate application.



If you work with a number of documents on consistent basis, but don't like a cluttered desktop, you'll find that Windows 95 offers several ways to get to them quickly.

Shortcuts are great for quick access to documents, but if you don't want to clutter your desktop, you have another option. As with applications, you can drag documents onto the Start button and have immediate access to them by simply selecting them from the Start menu. Be careful not to overuse this, or you'll end up with a Start menu that has to cascade off itself.



You want to create a new document, but you don't want to go through the hassle of finding the application, launching it, and navigating through the File Save box.

In other words, you're a documentcentric sort of computer user. No problem—just get used to creating files and folders with the right mouse-button. By default, shortcut menus include a New option that has entries for WordPad rich text documents, unformatted text documents, bitmap pictures, sound files, and any file created by one of the leading word processors or spreadsheets. Once you get into the right rhythm, working with a new file is a snap.

First, right-click on the desktop, choose New, and pick the file type from the cascading list. The generic name "New Text Document" is highlighted, so you can instantly give it a more meaningful name. Press Enter to record the new name, and press Enter again to open the document with its associated application. When you've finished working with the file, you can leave it there, drag it to another folder, or use the SendTo menu to file it in a preset location.

Templates for registered file types are stored in the ShellNew folder, which is found under the Windows folder. Any changes you make to these template files will automatically appear in every file you create using the New menu.



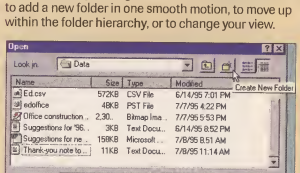
Dragging and dropping a file from a folder into a running application window works really well—unless there's already an open document.

However, there are ways to open a second file in its own window. The absolutely foolproof way to open a file is to drop it on the application window's title bar. If the application supports multiple document windows (as Word for Windows does), you'll end up with a new document window. For WordPad, Notepad, and other applications that handle only one file at a time, however, the new file will replace the old one. (You'll be offered a chance to save your changes.) You can also drag a document onto any program icon on the Taskbar and the program will come to the front with the new document open.

ED BOTT

HOT TIP NEW FOLDERS ON THE FLY

Mini-Explorer: There's more to file management than just opening and saving. That's the logic behind the Windows 95 common dialog boxes, which are actually miniature versions of the Windows Explorer. As long as your application uses these dialog boxes, you can move, rename, and delete files and folders; inspect a file's properties; or create a new file or folder on the fly, with just a right-click. Use the mini-toolbar to add a new folder in one smooth motion, to move up within the folder hierarchy, or to change your view.



SUPERTIP Blast Through Windows

Bless their hearts, Microsoft left a few gazillion keyboard shortcuts in Windows 95. Most of the time, the mouse is the fastest way to get a job done, but there are times when a single, well-placed keystroke is worth a half-dozen clicks. Here are the essential keyboard shortcuts to keep your fingers trained for speed when working with folders:

- Press F5 to refresh the contents of the current window. It's particularly handy if you've just created a new file or folder, because Windows 95 places new entries at the end of the list by default.
- Backspace marches up the directory tree to the parent of the current folder.
- F3 opens the Find command in the current folder.
- Shift-F10 pops up the shortcut menu for the selected object, just as if you had right-clicked.
- Ctrl-X, Ctrl-C, and Ctrl-V let you cut, copy, and paste files, respectively.
- Ctrl-Z undoes the last rename, delete, copy, or move. Windows 95 remembers and can undo up to three shell operations.
- Ctrl-Esc pops up the Start menu. Press R to open the Run dialog box, then enter a path name (like C:\WINDOWS) to open that folder window instantly.

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If you've always wanted a top performing monitor, now is the time.

Even the coolest dudes find Nanao's new 17" monitors way cool. The new F2·17EX and T2·17TS models can't be beat for the ultimate in text and graphics performance. Which is why they're setting sales records at savvy computer stores. Another reason is Nanao's Windows 95 Plug & Play* compatibility. Complicated user set-up adjustments at the time of installation are virtually eliminated. And switching resolutions on-the-fly is a snap. Users are also drawn by Nanao's reputation for outstanding long-term reliability plus the stunning array of new advanced technical features that are ideally suited for graphical environments. Nanao even offers a choice of four 17" models to satisfy your budget, application requirements and tube preference. The F2·17EX features an ultra fine dot pitch Invar shadow mask flat-square tube, while the T2·17TS features the new hybrid technology aperture grill tube. Both monitors provide the power you need to achieve true-to-life colors, crisp typography and a stable screen image. Flicker-free resolutions up to 1280 x 1024 @ 82Hz refresh rate, Colorific™ screen/printer color matching software and on-screen image controls deliver previously unheard of levels of performance. For added safety against emissions, TCO compliance is now available as a standard feature.

If you're wondering why this dude looks so satisfied, it's easy to figure out. He just caught the perfect wave. And the perfect 17" monitor.

F2·17EX	
Dot Pitch	0.26mm
Actual Viewing Diag.	16.1"
Scan Freq.	H:30-86kHz, V:55-160Hz
Rec. Resol.	1280 x 1024 @ up to 82Hz
Max Resol.	1600 x 1200 @ up to 66Hz
On Screen Control	ScreenManager™ and ScreenManager™ Pro
Standards	MPR-II, TCO, FCC B

T2·17TS	
Grill Pitch	0.25mm
Actual Viewing Diag.	16.0"
Scan Freq.	H:30-86kHz, V:55-160Hz
Rec. Resol.	1280 x 1024 @ up to 82Hz
Max Resol.	1600 x 1200 @ up to 66Hz
On Screen Control	ScreenManager™ and ScreenManager™ Pro
Standards	MPR-II, TCO, FCC B

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Managing Files



Of all the changes in the Windows 95 interface, perhaps the most subtle is the way it lets you manage files. For moving, copying, renaming, deleting, and organizing files, all the tools you need are available just about anywhere, just about anytime. There's no need to fire up a File Manager to create a new directory, for example. You can accomplish that everyday task by clicking on a button inside any common dialog box.

Virtually every file management tool consists of the Windows Explorer in one form or another. There's the two-pane Explorer view, the contents-only view (minus the tree pane) you get when you open a folder window, and the condensed version of Explorer that gives you access to files from within a common File Open or File Save dialog box. Look in the Windows 95 Resource Kit for the complete command-line syntax for Explorer, which lets you create custom views of your data and attach them to shortcuts on the desktop.

There's new information in file properties sheets, including the date on which a file was last accessed in addition to the date it was last modified. You can view and reset file attributes (Hidden, Read-Only, Archive, System) here as well. And there's a greatly expanded Find utility that can track down saved information with even the barest of clues.

Ready to move beyond File Manager? Start here.

Quick Results

- **Turn off delete confirmation.** You'll go quietly mad if you have to deal with an "Are you sure . . . ?" dialog box every time you delete a file, but that's the Windows 95 default. Right-mouse-button click on the Recycle Bin and uncheck the box on the first page of its properties sheet to disable this feature.
- **Adopt a naming convention.** This is a good idea if you share files with other users who can't read or write long filenames. Because of the way Windows 95 automatically generates short filename equivalents, you may want to begin every long filename with a meaningful, six-letter version for the benefit of Windows 3.1 and DOS users.
- **Make Explorer the default action.** If you prefer to always work with Explorer, make it the default action when you double-click on a folder icon. From any folder window, choose View, Options, click on the File Types tab, and highlight the entry for Folder. Click on Edit, highlight Explore in the Actions list, and click on the Set default button. Now, when you double-click on a folder it will open in Explorer view.
- **Create a simplified Explorer shortcut.** Use it to access your main hard drive. In the command-line box, enter C:\WINDOWS\EXPLORER.EXE /e,/root,C:\. For a full explanation of the Explorer switches, look in the Windows 95 Resource Kit (found on the CD-ROM).
- **Add the QuickView utility.** File management is much easier when you know what's in the files. Surprisingly, though, none of the default Windows setup options installs this file-peeking utility. To add it, rerun the Windows 95 CD-ROM setup and look under Accessories.



If you use long filenames, file management is nearly impossible from a command prompt. You can use drag-and-drop actions instead, but they work a bit differently from their Windows 3.1 counterparts.

Dragging files from one folder and dropping them in another looks simple, doesn't it? Well, looks can be deceiving. For anything but the simplest file management tasks, successfully dragging and dropping files means learning several mind-numbing rules: (1) When you drag a file from one folder to another on the same drive, Windows moves the file. (2) When you drag a file to a folder on a different drive, Windows copies the file. (3) If the original file is executable (COM, EXE, or BAT) and you drag it to a folder on a hard disk, you create a shortcut by default. If you drag it to a floppy, you get a copy. (4) Holding down Shift while you drag forces a move, Ctrl forces a copy, and Ctrl-Shift creates a shortcut.

Remembering all these rules is nearly impossible. Fortunately, if you right-drag the files from point A to point B, you'll see a pop-up menu with all your available choices (the default actions, as described above, are listed in boldface type).



The new Windows 95 interface makes it easy to find and view files, but it isn't always convenient for dragging and copying them.

The Windows 95 interface includes cut, copy, and paste commands that let you move and copy files with minimal effort. These commands (and their keyboard alternatives Ctrl-X, Ctrl-C, and Ctrl-V, respectively) work in folders, in the Windows Explorer, across network drives, and even in common File Open and Save dialog boxes. There's also a Paste Shortcut option that lets you copy a

selected file or group of files, then create instant shortcuts to those files in another folder. Once you've pressed Ctrl-X or Ctrl-C, you can close the original folder window and still complete the Paste operation.



With the Windows 3.*x* File Manager you can use wild cards to display a subset of the files in a directory. In Windows 95 you need to use the Find utility.

You can't filter the display of objects in an open folder window or the Windows Explorer. But you can use the Find dialog box to accomplish the same goal in a new window. If you have great eyesight and a steady hand, right-mouse-button click on the tiny icon at the left of a folder window's title bar and choose Find from the shortcut menu. It's a little easier with the Windows Explorer, where you can choose Tools, Find, Files or Folders from the main menu. Or you can do it the ridiculously easy way: Just press F3.

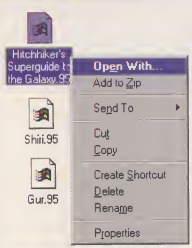
The Find utility is fast and surprisingly versatile. Here are a few of the things you can do with it:

- Enter a text string in the "Named" box and Windows will find any filename that contains that string. If you leave this box blank and click on Find Now, you'll get a list of every file in the current folder and all of its subfolders.
- To search through a variety of folders, enter multiple folder names (separated by semicolons) in the "Look in" box.
- Use the Date Modified tab to narrow down the list of files, and click on the Advanced tab to define file types or text strings to search for.
- Save searches you'll want to reuse. "Documents created or modified in the last week," "Temp files," and "Excel spreadsheets" are good candidates. When you choose File, Save Search, Windows plops an icon

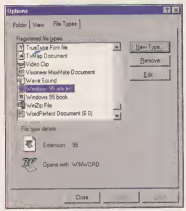
SUPERTIP **Keep the Root Directory Clean!**

As with DOS, Windows 95 doesn't like many files in the root directory. For backward compatibility, Windows 95 uses the DOS file allocation table (FAT), linking FAT entries to store long filenames and extended file attributes. The longer the name, the more FAT entries it uses. Because the root directory is still limited to 512 entries, it fills up quickly. When it does, there's no telling how your apps—especially 16-bit Windows programs—will handle the resulting error messages.

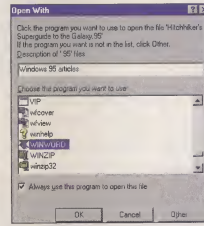
GUIDED TOUR MAKING WINDOWS 95 UNDERSTAND YOUR FILES



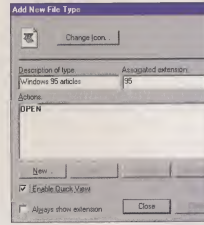
When Double-Clicking Doesn't Work: If you want to open a file and Windows 95 claims it doesn't know what application to use, try right-clicking to use the Open With command. Or double-click and let Windows 95 open the Association dialog box for you.



Exploring Your Options: You can make permanent associations with View, Options in Explorer. Go to the File Types tab and choose the New Type button. This way you can create a new file type and associate it with the application of your choice.



What's My App? In the Open With dialog box, Windows 95 lists all of the known applications on your hard drive so you can match the file you're trying to open with the application of your choice.



Association Types: The File Types tab lets you view the details of each file type listed in the Registry. Use the Edit button to choose an icon, then select the required Actions, and customize your association.

on the desktop. Give it a meaningful name and move it into a folder that's easily accessible.

• In order to sort the list of files by name, date, or size, click on the appropriate column heading in the Results window.

Caution: You can check Save Results on the Options menu, but that doesn't update the Find window each time you open it. To make sure the window contents are accurate, click on the Find Now button each time you open a saved search.



You know how to use Find to locate files, but you don't know what to do with those files once you've found them.

For all intents and purposes, the Find window is the Windows Explorer with a few extra buttons. You can delete, copy, move, or rename any object in the Find window. You can also create shortcuts. In fact, with a little creativity you can duplicate a Windows 3.1 feature that didn't make the leap to Windows 95: setting up all the programs on a hard disk. Search the entire drive (including subfolders) for files of type Application, then pick and choose the ones you want to add to your Start menu or desktop.



Working with a crowded folder in Large Icons view is nearly impossible. Unfortunately, that's the Windows 95 default. Here are your other options . . .

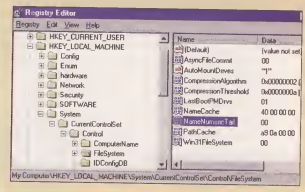
For every folder window, including the right-hand pane of the Windows Explorer and the Results pane in a Find window, you have your choice of views. Large Icons View is good for windows with a limited number of icons you're likely to want to use. My Computer and Control Panel work well in this view. The Small Icons View lines up all the icons in compact rows. Assuming you've sorted by name, all the icons will appear in alphabetical order in neat rows from left to right, with folders at the top of the list. In this view, as in Large Icons View, you can move icons to random positions within the folder window. If you prefer to keep things tidy, you can use the Line Up Icons command in the View menu to make sure everything arranges itself in neat rows. AutoArrange goes one step further by making sure that everything always stays nicely aligned. (You can also use these commands to clean up Shortcuts and other icons on your Desktop.)

The List View looks similar to Small Icons View, but the entries are arranged from top to bottom—in columns rather than rows—and you can't move an object out of its place in the list.

Details View is the most like a familiar DOS directory or File Manager display. You can use Details View if you need to sort by filename, file type, file size, or creation date. Simply click on the appropriate column heading to initiate a sort; click again to reverse the sort order. **ED BOTT**

HOT TIP TWEAK **NAMING** CONVENTIONS

Short Filenames: Don't like the way Windows 95 tacks a tilde and a number onto the short version of your long filenames? Change its behavior so that unique, autogenerated, DOS-style, eight-dot-three names are stored without tails. Start the Registry Editor (REGEDIT.EXE). Search for the FileSystem key shown in the status bar below, and in the right pane add a binary value of NameNumericTail and set it to 00. (Warning! Editing the Registry isn't for the faint-hearted—be sure you're fully backed up.)



SUPERTIP **Fill SendTo with Shortcuts**

When you right-click on any file—in the Windows Explorer, in a folder window, or in a common dialog box—one of the options that pops up is a cascading menu called SendTo. Choose it and you can pick from a list of default destinations for the selected file or files, including floppy drives, the Briefcase on the desktop (if you installed that utility), and even an e-mail or fax recipient, if you're using Exchange. But that's a small fraction of the things you can do with this versatile feature. You can add any program, folder, or drive to the SendTo menu, just by opening the SendTo folder and creating a shortcut there. (You'll find the SendTo folder in the Windows hierarchy.)

Here are some suggestions for shortcuts to add to the SendTo menu: Notepad and WordPad, the QuickView utility (QUICKVIEW.EXE), or an image editor like Microsoft Paint. If you regularly move files to a certain folder after you've finished working with them, add a shortcut to that folder to the SendTo menu. You can also drag an icon from the Printers folder to the SendTo folder, then quickly send any file that's registered with Windows directly to the printer.



You're on the go. Calls are coming in. Days are getting shorter. Work at home is piling up. Don't miss that call. Send it to voice mail. Grab those faxes. Visit that customer. Conference calls. Meetings. Change that appointment.

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Circle 161 on reader service card.

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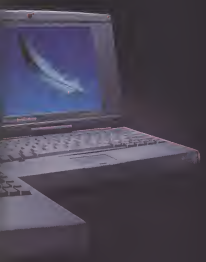
Extensa 550CD comes with integrated CD-ROM and 16-bit stereo sound for full multimedia capability.

Extensa 550's PCI Bus architecture enables optimal Pentium performance.

PCI BUS

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EXTENSA 450

- Weight: 5.0 lbs.
- DX4/75 processor
- 10.4" Dual Scan or 9.4" Active Matrix (TFT) display
- 4MB RAM, upgradeable to 32MB
- Serial infrared port

EXTENSA 550

- Pentium 75MHz
- 10.4" Dual Scan display
- 8MB RAM, upgradeable to 40MB
- Serial infrared port

EXTENSA 550CD

- Pentium 75MHz
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Now you can start working faster, start working better, start expanding your capabilities, start extending the power of a Pentium® processor, start using multimedia and, most important of all, start making your money work harder.

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TEXAS INSTRUMENTS

Circle 163 on reader service card.

THE TI EXTENSA 450. THE COMBINATION OF WEIGHT,



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Designed for Microsoft® Windows®95

Just 5.0 lbs. – subnotebook weight.

Wireless printing or file swapping with infrared technology.



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- 4MB RAM, upgradeable to 32MB
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Powered by a 75MHz Intel DX4 processor, the TI Extensa™ 450 weighs just 5 pounds. Which means you'll save weight as well as money. TI Extensa gives you more machine for the money. The combined battery power gives you up to 6 hours of productivity. A serial infrared port gives you wireless connectivity. The removable floppy disk drive gives you support for additional PCMCIA cards, or even a lithium ion battery.

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PCI Bus architecture enables optimal Pentium performance.

PCI BUS

Infrared communications technology lets you swap files or print without wires.

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CAN GET THE POWER OF A THE PRICE OF A 486.

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- 10.4" Dual Scan display
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- 524MB HDD
- Type III PCMCIA slot
- Optional CD-ROM
- Weight: 6.2 lbs.
- Serial infrared port

There are many portable computers from leading manufacturers priced like the new TI Extensa™ 550. Trouble is, they probably don't come with Pentium® processors. They use DX4 or DX2 processors to power the machines. That's a whole generation—or two, behind.

And that's just the beginning. The new TI Extensa 550 extends the power of its Pentium processor with 256KB of L2 cache, allowing the processor to work at maximum operating efficiency.

START DOING EXTRAORDINARY THINGS™

What's more, the TI Extensa 550 uses the same circuitry (called Peripheral Component Interconnect or PCI) used in most desktop models for blazingly fast video monitors and improved disk drive performance. The TI Extensa 550 also comes with a serial infrared port, which lets you print or share files, wirelessly.

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Faster, more efficient processing from L2 cache (256KB).



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Integrated CD-ROM and 16-bit stereo sound for full multimedia capability.

PCI Bus architecture enables optimal Pentium performance.

PCI BUS

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ITS PRICE, THE ONLY THING DOESN'T HAVE IS COMPETITION.



EXTENSA 550CD

- 16-bit stereo sound for full multimedia capability
- Built-in speakers and microphone
- Full-motion video for dramatic sales presentations
- Weighs 6.4 lbs.
- Serial infrared port lets you swap files without wires
- Removable 524MB hard disk drive
- Powerful 75MHz Pentium processor
- Integrated CD-ROM player (interchangeable with floppy disk drive or a lithium ion battery)

- Integrated CD-ROM
- Pentium 75MHz
- PCI Bus architecture
- 256KB L2 cache
- 8MB RAM, upgradeable to 40MB
- 524MB HDD
- 10.4" Active Matrix (TFT) or 10.4" Dual Scan display
- 1MB video memory
- 16-bit stereo sound card, microphone and speakers
- Type III PCMCIA slot
- Weight: 6.4 lbs.

Remote control operation thanks to serial infrared technology.



Thanks to the new TI Extensa™ 550CD, now you can't afford not to take Pentium® multimedia on the road.

At its low price, you might find other portable multimedia machines, but they probably won't have Pentium processors, and if they do, they're not likely to have a built-in CD-ROM. But that's just part of the TI Extensa 550CD's superiority. For better high-speed video and optimal performance for CD-ROM applications, the TI Extensa 550CD uses the same circuitry (called Peripheral Component Interconnect or PCI) used in most desktop computers.

START™ DOING EXTRAORDINARY THINGS

There is also the extra convenience and versatility of the removable CD-ROM drive which allows you to use an internal floppy drive, or even to support a lithium ion battery for longer performance. And with a serial infrared port, the TI Extensa 550CD can print or share files, wirelessly.

To find all the capabilities of the TI Extensa 550CD at this price is extraordinary.

To get these capabilities working for you or to find out about our other models, call **1-800-TI-TEXAS**. E-mail: 2ti@msg.ti.com. Internet: (www.ti.com).

TEXAS INSTRUMENTS

Performance Power



If you spend the better part of your workday counting ceiling tiles or swearing at the hourglass cursor, it's a sure sign that your system is too slow. While several factors may contribute to the sluggishness of your computer, the good news is that there are simple fixes to work around some of the most daunting performance bottlenecks. The quick and easy method to improve your system's responsiveness, of course, is to invest in hardware upgrades. But if you aren't eager to dole out a lot of cash, there are other ways you can fine-tune your current hardware settings to maximize Windows 95's performance.

Quick Results

- **Speed your graphics.** If you own an accelerated graphics card, Windows 95 may not be using it to its full potential. To make sure you're enjoying all of its benefits, right-mouse-button click on My Computer, select Properties, click on the Performance tab and then select the Graphics button. To get maximum performance, move the slider all the way to the right. Microsoft recommends this setting, but it isn't always the default because it can cause conflicts on some systems.
- **Tune your disk.** Keep your hard disk well tuned by running ScanDisk and Defrag on a regular basis. These bits of preventive medicine will help you avoid problems and keep your drive running at top speed.
- **Reduce the size of your Recycle Bin.** The Recycle Bin is preset to take up 10 percent of your hard disk for storing deleted files, but you can get away with less. Right-click on the Recycle Bin, select Properties, and use the slider to reduce the maximum size of the Recycle Bin to 3 or 4 percent.
- **Use protected-mode drivers.** When buying new devices, make sure they have protected-mode drivers. To check on your existing drivers, right-click on the desktop, select Properties, and switch to the Performance tab. If any drivers are older, 16-bit versions, you'll see a message at the bottom of the sheet listing those devices that are not optimized for best performance. To obtain new versions, check the contents of the Drivers folder on the Windows 95 CD-ROM, then try calling the vendors or Microsoft. You can also download copies of these files from Microsoft's Web page (http://www.microsoft.com).

You can also improve your system's performance by speeding access to commonly used programs and files and by taking advantage of the new technologies built in to Windows 95, such as the dynamic cache settings and swap files.



Microsoft claims that you can run Windows 95 with a minimum of 4MB of RAM, but in reality you will need more.

There should be a law: When you upgrade your operating system, you must increase your RAM. Microsoft says you need at minimum a 386 system with 4MB of RAM, but the key word here is *minimum*. As in bare bones. You'll be able to play Solitaire and Hearts on a system with this configuration, but you won't be able to do much more. In fact, if you can't upgrade your 4MB system to at least 8MB, you're better off not upgrading to Windows 95 at all. While entry-level systems today come with 8MB, we recommend 16MB for any serious office system that needs to juggle large spreadsheets, databases, and word processing files in addition to e-mail, fax, and the requisite Web browser. And if you're buying a new system, make sure its RAM is upgradable to 64MB or more, because you're sure to develop an insatiable appetite for more RAM in no time.

Without enough RAM, Windows 95 can't cache your hard disk and CD-ROM drive. Unlike Windows 3.*x*, which didn't make use of more than 16MB of RAM and rarely distinguished between 8MB and 16MB, Windows 95 can use as much RAM as you can afford to throw its way, and its dynamic disk cache will grow to very large sizes. We've run it on 64MB machines and had it using a cache of more than 50MB.



Under Windows 3.*x*, you often ran out of system resources, even while you were running only one application.

Even if you have plenty of RAM to go around, there's still one nagging problem: your ever-diminishing system resources. Windows 3.*x*'s poor handling of system resources is well-documented, and Windows 95 has improved this feature tenfold, but the problem still exists to some extent. Always keep an eye on your available resources, and when they drop to the 50 percent line, start cleaning up by closing files.

To see your current system resource level, right-click on My Computer, select Properties, and click on the Performance tab. While this is a good start, it doesn't give you the whole picture because you don't get the

graphics device interface (GDI) and User resources in this dialog box. For more information you need the Windows 95 Resource Monitor. Copy the file RSRCMTR.EXE from the Admin folder on the Windows 95 CD to your hard disk (this utility doesn't come with the floppy-disk version), and place a shortcut to it in the StartUp folder. The Resource Monitor anchors itself to the system tray (on the right side of the Taskbar), and you can get System, User, and GDI resource information by moving your pointer over it. Or double-click on this icon for a dynamic bar-chart display.

SUPERTIP **Do Away with the Fluff**

Sure, wallpaper depicting an extinct African lion is more attractive than a plain black screen; and a purple dinosaur wiggling its tail at you beats that boring hourglass in the cuteisness competition, but at what cost? If you have plenty of resources to spare, go ahead and get fancy with your wallpaper and animated cursors. But most serious users just can't spare system and GDI resources for fluff, so they stick with the less-resource-hungry options: static cursors and a solid-color background for the desktop. And avoid Microsoft Plus themes, which are resource-devouring monsters.

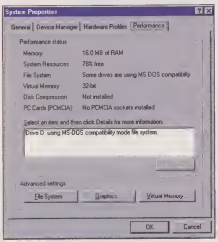


Your hard drive may be slowing down your overall system performance.

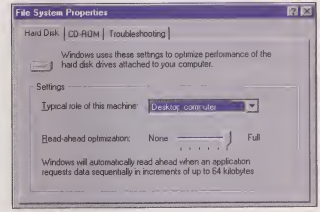
A common reason for sluggish hard disk access is file fragmentation, which is a simple malady to overcome. Run Defrag regularly, either manually (from Start, Programs, Accessories, or System Tools), or using the scheduling agent in Microsoft Plus. Alternately, if you make many changes to your system every day (such as regular installation of new programs and removal of old ones, or large database updates), add a shortcut to the Defrag icon to your StartUp group. Use the command-line option C:\ /U /NOPROMPT for an unattended file defragmentation every time you boot.

You can also add a ScanDisk shortcut to your

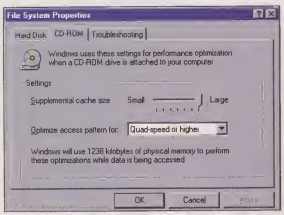
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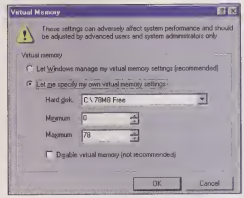
Take a Peek: Right-click on My Computer and select Properties. Then click on the Performance tab to view available system resources and a list of devices that use real-mode drivers.



What's My Line? To optimize the system's configuration, click on the File System button and identify the system as a desktop computer, server, or dockable notebook.



Go for a Spin: Click on the CD-ROM tab to identify your CD-ROM drive's speed as single-speed, double-speed, or quad-speed or higher.



Leave It Alone: Windows 95 can set up its swap file better than you can 99 percent of the time, but you can still adjust it.

StartUp group with the command-line option /A /N, so ScanDisk can check your hard disk in a non-interactive mode. If you do, don't forget to add the *drive:\drvspace.mnn* parameter for compressed DriveSpace volumes. Also, you'll need to create a batch file to get both ScanDisk and Defrag to work together at start-up.



Older, non–Plug and Play devices will work with Windows 95, but without new 32-bit drivers they'll slow system performance.

If you have older (a.k.a. "legacy") hardware, like a CD-ROM drive or network card, there's a chance that the drivers you're using are of the 16-bit real-mode type. This is especially true with non–brand-name devices: Windows 95 comes with plenty of protected-mode drivers for mainstream devices, but with some lesser-known CD-ROM drives you may have a harder time finding the newest 32-bit drivers. Contact the manufacturer directly for details on how and when you can get the newest versions for your hardware.

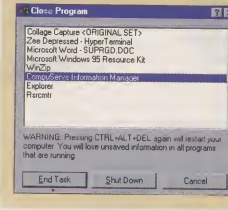
To check whether any of your devices are running in the old DOS mode, right-click on My Computer, select Properties, and click on the Performance tab. If you see the message "Your system is configured for optimal performance," your entire system uses protected-mode drivers. However, if the dialog box informs you that "Device *x* is using MS-DOS compatibility," you need to do something about it. And soon. Try running the Add New Hardware Wizard from the Control Panel to see if Windows 95 has a driver for that device, or call the vendor and find out whether there's a new driver you can download from a BBS. You might also check Microsoft's Web page for new drivers. After you install the newer driver, remove the reference to the real-mode one from your CONFIG.SYS. In fact, if you don't have any real-mode devices, you don't need CONFIG.SYS at all. It's only there for backward compatibility.

SUPERTIP **Don't Touch That Cache**

Windows 3.*x* users commonly adjusted disk cache and virtual memory settings to improve system performance, but Windows 95 has made this expertise practically obsolete. Although you can still adjust these settings in the Control Panel under the Performance tab, Windows 95 does a great job of optimizing the dynamic disk cache and swap-file size on its own, and user intervention usually means deterioration in performance. Disabling virtual memory is also not recommended.

HOT TIP PROGRAM **CLEANUP**

Not Just a Panic Button Anymore: One way to get out of trouble in DOS and Windows 3.*x* is the Ctrl-Alt-Del combination. In Windows 95 this hotkey brings up a dialog box that lists all the running programs, so you can close ill-behaved ones that refuse to remove themselves from memory, or just view what's currently running. Remember, not all running programs show up on your Taskbar. Virtual device drivers (VxDs) will show up only in the Close dialog box.





Windows 95 offers a lot of networking support, but you need to configure it properly to get the best performance.

When it comes to networking under Windows 95, excess baggage can be a serious problem. Don't load protocols your system doesn't use, and avoid binding protocols to network components they'll never use. To see what's installed, open the Network Control Panel. Before you actually remove any, keep one thing in mind: This should fall under the "Kids, don't try this at home" category. If you don't know what any protocol does, don't touch it—unless you're on good terms with your IS people. If you are, or if you're certain that the protocol isn't being used, go ahead and remove it. Click on each protocol, select Properties, and click on the Bindings tab to view or modify the binding information.

Another common gotcha in Windows 95 networking is drive mapping. Unless you're using antiquated 16-bit applications that don't support the universal naming convention (UNC)—which takes the format of \\SERVERNAME\DIRECTORY—you don't really need to map drives, because drive mapping takes up some of your precious memory. And most bread-and-butter 16-bit applications do support UNC. A much more efficient way to get to a network drive is to create a shortcut to it on your desktop.

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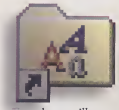
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Printing and Fonts



No matter what gains have been made in networking, the Internet, and all the other forms of paperless communication, there will still come a time when you'll have to print a document on paper. And when you do, you'll want your document to look professional, interesting, and creative, so font and printer management will be essential. Windows 95 provides substantial improvements over Windows 3.1 in its use of printers and fonts. Printer installation and management is infinitely easier, and monitoring the progress of your print jobs has never been more straightforward or user-friendly, thanks to built-in print utilities.

Quick Results

• Preview your fonts. Want to see what a font will look like—either onscreen or on the page—before you use it in a document? Double-click on the font's icon to open a view you can print to show how it looks when scaled to a number of different sizes. You can also see how fonts compare by using the List Fonts By Similarity option under the View menu in the Fonts folder.

• Speed up print times. If you spool to an EMF file, the new printing architecture in Windows 95 can print files almost twice as fast as Windows 3.1. To take advantage of this feature, open the Printers folder, highlight your main printer, choose Properties (either from the File menu or by right-mouse-button clicking on the icon), and then click on the Spool Settings button in the Details tab. You can adjust a drop-down menu showing the data format used.

• Install network printers. To quickly install a network printer, locate it in Network Neighborhood and drag it to your Printers folder.

• Manage your fonts. Font installation used to be a tedious process with too many buttons to click. In Windows 95, you install fonts simply by dragging any TrueType font, or a corresponding shortcut, to the Fonts folder. You remove them by dragging the icons to another folder or by deleting the icons. Note, however, that you can't install a font by merely copying it to the C:\WINDOWS\FONTS directory at the DOS command line; that won't work. To make the magic of drag-and-drop fonts a reality, Explorer treats the Fonts folder specially and does more than just copy the main font file when you drag and drop fonts.



In the past, you've spent long periods of time installing local and network printers.

The quickest way to add a printer in Windows 95 is to either double-click on the Add Printer icon in the Control Panel's Printer folder or start the Add Printer Wizard by clicking on the Add New Hardware icon in the Control Panel. Once a printer has been installed, its icon can be used as a target for quick printing—just drag the file you want to print over that icon. Printer icons also serve as access points for print-queue configuration and management.

To install a shared network printer, find the printer you want in the Network Neighborhood and drag it to your Printers folder. This will normally invoke the Add Printer Wizard and lead you to choose the proper drivers from the list of supported printers. If the host for the printer is also a Windows 95 machine, your local Windows 95 machine will automatically copy the proper drivers with no action required of you.



You're responsible for administering network printers, and you're looking for simple apps you can run from your desktop.

If you're connected to a NetWare network and have administrator privileges, you can add the NetWare print server, called PSERVER, to your desktop machine. This server administers the NetWare print queue and downloads print jobs to any local printer attached to a Windows 95–based PC running the Microsoft Client for NetWare Networks. To install PSERVER, open the Network Control Panel and choose Add and then Service. Click on the Have Disk button and go to the Admin folder on the Windows 95 CD-ROM. From there, go to the NETTOOLS folder and the PRTAGENT folder inside. Click on MSPSRV.INF. Click on OK and PSERVER will be installed.

Microsoft has also included a Hewlett-Packard utility called JetAdmin that gives you even more power and control to administer and configure your printer, particularly with networked or shared printers on Microsoft Network and NetWare networks. Not only will JetAdmin let you configure your printer as you would in the Standard Printer Control Panel, it will also let you administer the print queue directly from your remote PC. To install JetAdmin, open the Network Control Panel and click on the Add button. Choose Service and then Hewlett-Packard. From there, choose JetAdmin and click on the OK button.



If you're into desktop publishing or just like using lots of fonts, the new font-management capabilities built into Windows 95 will make your life a lot easier.

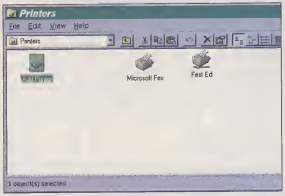
The key to configuring your fonts is a folder called—oddly enough—Fonts, which is located inside the Windows directory of your main drive. You'll also find a shortcut to this folder in the Control Panel, and like virtually any other Windows 95 component, you can drag one or both onto your desktop. Each font is displayed as a separate icon in the Fonts folder; scalable TrueType fonts are marked with a TT icon, and bit-mapped system fonts are marked with an A. You can install a new font in your system by dragging the corresponding TrueType file to the Fonts folder, and you can uninstall a font by deleting the icon (which also deletes the font file from your hard disk), or by dragging the icon to some other folder.

If you double-click on a font icon in the Fonts folder or on a font file in Explorer, Windows 95 will display a printable font sample. You can open several font-sample windows and compare them side by side to help choose which better meets your design and document needs. There's also use some magic that's built in to Windows 95 for finding exactly the right font. The List Fonts By Similarity option in the Font View menu uses Panose numbers, a system developed and used by font makers to

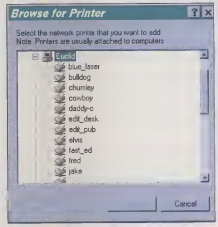
SUPERTIP **Smooth Your Fonts**

If you have the Microsoft Plus utility pack and are running 256-color video, be sure the Font Smoothing check box is checked in the Plus tab of the Display Properties sheet (right-click on the Desktop and choose Properties). This turns on the anti-aliased screen fonts feature, which is an especially useful option when you're using large point sizes. Do this only if you have an accelerated video card though, because of the performance hit.

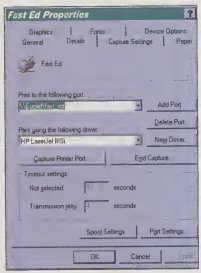
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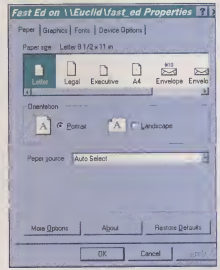
Get Started: To install a printer, open the Printers folder and double-click on the Add Printer icon.



Network Know-how: If you're installing a network printer, you don't need to know the path for it. Just use Windows 95's built-in Browse button to help find it, as you would any other file.



Get Configured: Once your printer is installed, right-click on its icon and choose Properties to configure it. Clicking on the Details tab will give you all the information you need on where and how your printer is connected to the network.



More Choices: You can also access some printer configuration file tabs from directly within an application. In Microsoft's Word 95, for example, choose Properties from within the printer dialog box.

Windows 95: Enhanced Print Spooling Lets You Print Faster

determine font similarity based on stroke width, height, and other characteristics. You can use this to help locate other fonts similar to ones you already use. For example, if you want a font like Arial but with a subtly different look, this is the way to find it. The button bar for the folder has an extra button for quick shifting to the similar-fonts view.

Another option worth knowing about is Hide Variations in the View menu of the Fonts folder. For example, by selecting this option you show only Arial instead of separate Arial, Arial Bold, Arial Italic, and Arial Bold Italic. Note, however, that you'll still see the same number of files; they'll all just be called Arial.



Do you end up spending half your day walking back and forth to the printer to see whether or not your files have finished printing? You need utilities that will help you to track your print jobs and save you the runaround.

If you have several print jobs pending and you want to be able to monitor their progress, double-clicking on a printer icon in the Printers folder brings up an applet that allows you to manage the queue for that printer—even to the point of reordering or deleting entire print jobs. If you're in a networked environment, you can even delete the jobs of your coworkers!

When a long job prints, a printer icon appears on the right side of the Taskbar. Double-clicking on it brings up the same spool-control applet. Right-clicking displays a quick status report.

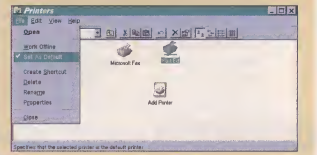
To help make sure people in your office don't accidentally take part of your printouts, you can separate print jobs with a blank page or other standard separator. Just double-click on your printer icon, choose Properties from the Printer menu, and change the separator page option to something other than None.

SUPERTIP **Keep Track of Your Fonts**

If you want to keep your favorite fonts in a location other than the Fonts folder, you can store the file in the folder of your choice and then right-click and drag the font file to the Fonts folder. Choose Create Shortcut from the options listed in the drop-down menu. The font will then be properly installed in the Registry with a pointer to the directory where you placed it. When you open the Fonts folder, the font will appear in the list with an arrow indicating that it is a shortcut. In fact, there is no file in the Fonts folder that corresponds to the shortcut. When the Fonts folder is drawn, it picks up registered fonts that aren't in the folder and draws them as virtual shortcuts. To uninstall a font, drag its shortcut back to the directory the font file is stored in. But be aware that if you delete the virtual shortcut, the original font file will be deleted as well.

HOT TIP EASY PRINTING

Set a Default Printer: Windows 95 makes it very easy to set a default printer so that every application on your system will print to the same printer without having to be set up individually. To select a default printer, highlight its icon in the Printers folder, pull down the File menu, and choose the item labeled Set as Default. If the printer is already your default, there will be a check mark next to that choice when you pull down the File menu.



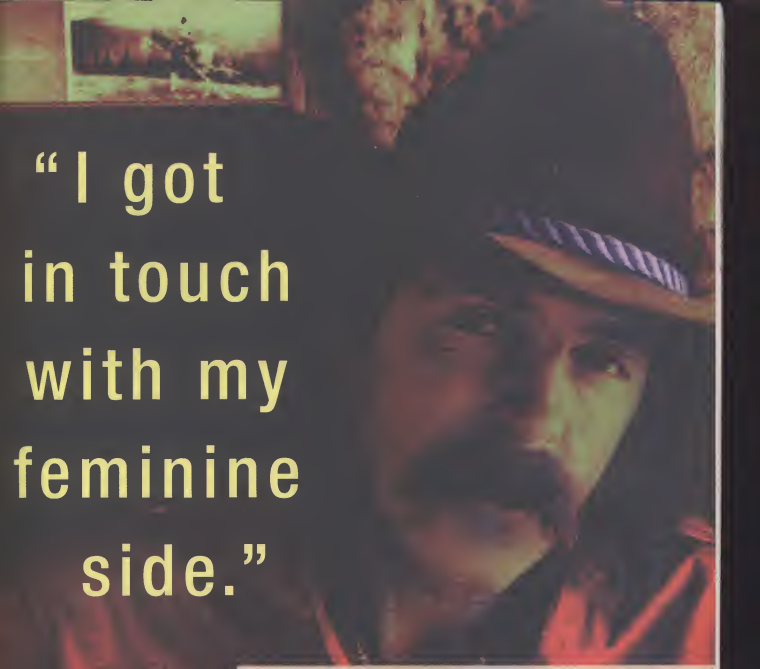


Departmental and workgroup printers are getting faster and faster, but they won't save you much time until you regain control of your PC after you print.

Printer spooling in Windows 95 is vastly improved over Windows 3.1. The Windows Metafile Format (WMF) has been extended to the Enhanced Metafile Format (EMF), which can double print performance, particularly over the Raw printer output option. To maintain compatibility with applications that support only raw output, however, Windows 95 includes an option to spool to raw files. To select it, double-click on a printer icon, choose Properties from the Printers menu, click on the Details Tab, click on the Spool Settings button, and select Raw from the Spool data format drop-down menu on the right side of the sheet.

If you have plenty of disk space and want to get back into an application as soon as possible after you print, try this trick: Open a printer in the Printers folder by double-clicking on it, choose Properties from the Printers menu and click on the Details tab, then click on Spool Settings and check the radio button in front of the option called Start Printing After Last Page Is Spooled. This will delay the start of printing by spooling the entire print job to disk, but it's the fastest method for wresting control of your machine back from the printing process.

To print files without editing them, drag a printer icon from the Printers folder to the desktop. Then if you drag a file from Explorer to that icon, the printer will print that file—as long as the file has a registered extension. BENJAMIN F. MILLER AND BARRY SIMON



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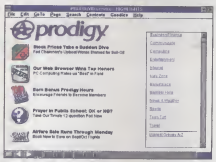
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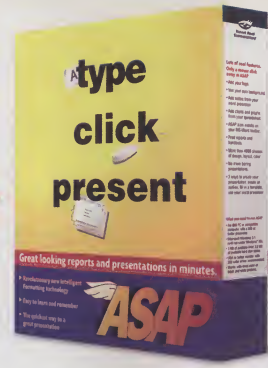
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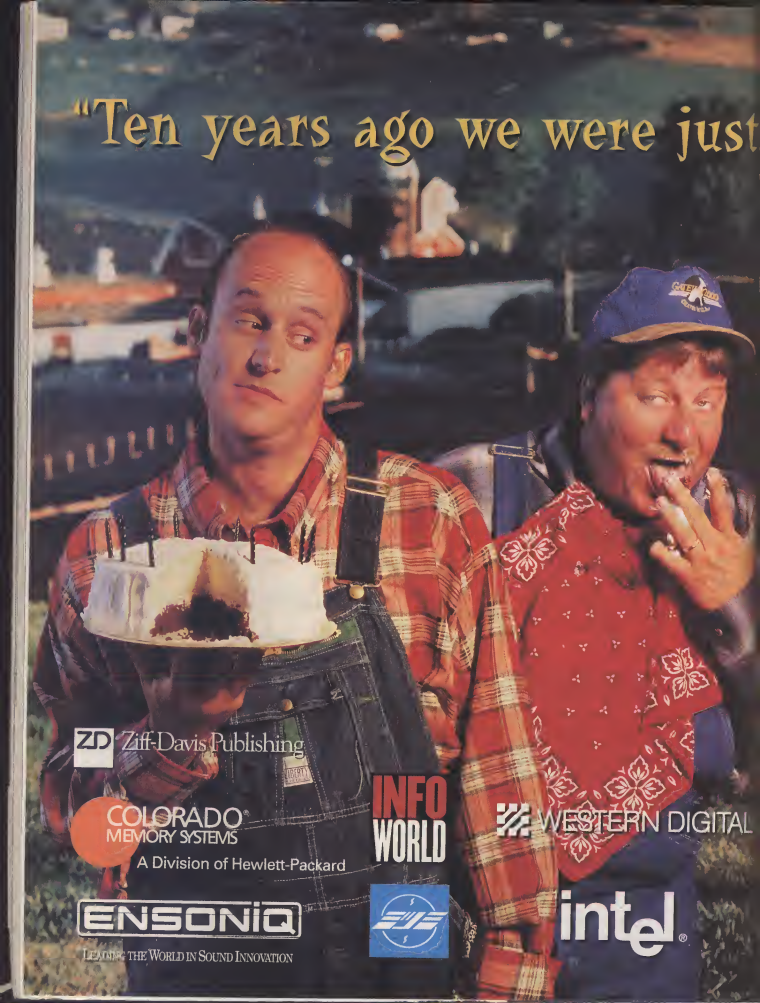
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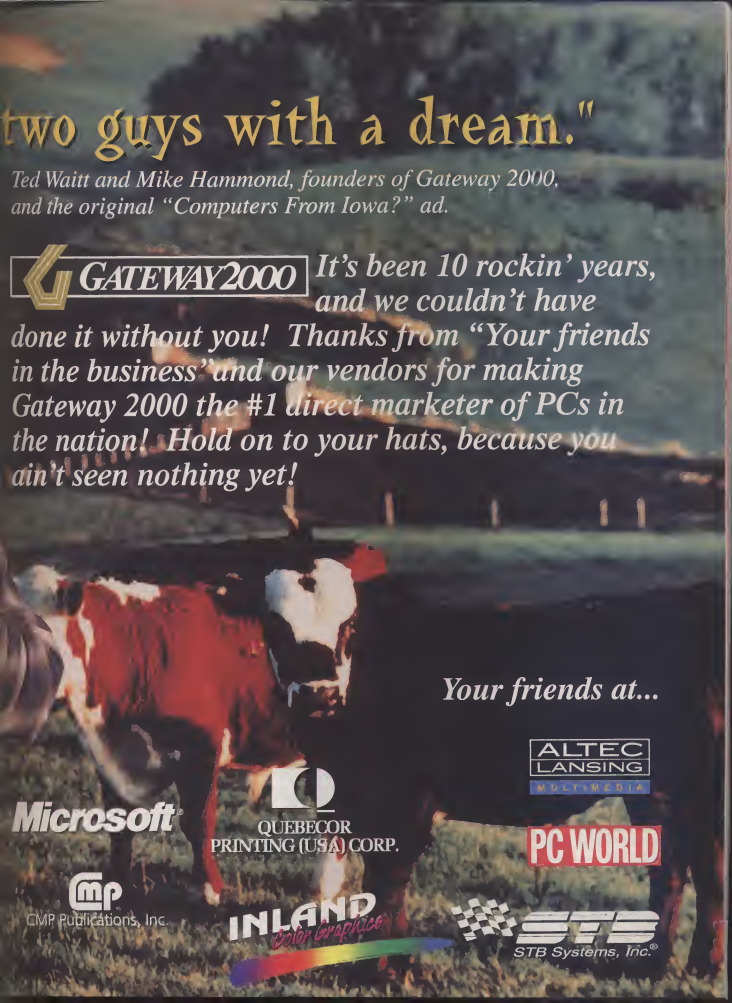
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Practical Multimedia



Windows 95 does multimedia better than Windows 3.1. No big surprise here, but it should be a relief to those who have struggled through the hell of installing and maintaining sound cards, CD-ROM drives, and digital-video cards under Windows 3.1. Recognizing that computer users now expect more than just text and 16 colors, Microsoft has integrated strong audio-visual support into the operating system on many levels. Whether you want to add sound events to mouse clicks, play audio CDs in the background while you work, or view digital-video files, Windows 95 includes the components you need to have more fun and be more productive with multimedia. You just need to know where to find these components and how to capitalize on them.



Although digital video in Windows 3.1 was satisfactory, it was hardly trouble-free. You want to learn how Windows 95 improves the picture.

One of the most easily recognizable benefits of Windows 95 is that you have instant video capability as soon as you install the operating system onto your PC. In comparison, under Windows 3.1, Video for Windows (VFW) was an add-on utility that never quite fit in. As a result, developers and users alike will have full video functionality and won't have to worry about incompatibilities or missing software drivers.

You can, of course, improve video performance by upgrading your video card, but there are a few things you can do right away without having to spend the extra money. First, play video files and multimedia applications at pixel resolutions no greater than 800 by 600. This will reduce the strain of producing higher resolutions so the video card can expend its energies on a smoother, faster video picture. This rule is also true of color depths and video window sizes. Most multimedia programs are designed to run at a 640-by-480-pixel resolution anyway, so you're not missing anything.

Also, wait for Windows 95 versions of multimedia titles to appear in software stores. Most older Windows 3.1 applications will work just fine, but they're not designed to take advantage of Windows 95's built-in multimedia capabilities the way these new titles will be. Look out for Windows 95 versions of some of your favorite DOS games, too. In fact, you won't really be able to enjoy most of the benefits of Windows 95's supercharged multimedia capabilities until you use these newer third-party titles.



You're aware that Windows 95 has an abundance of multimedia features, but you may not know exactly where to find them.

If you installed Windows 95 from the distribution CD and chose Typical installation—and Windows 95 correctly identified your CD-ROM drive, and video and sound cards—you already have everything you need to put multimedia through its paces.

If, on the other hand, you installed Windows 95 from floppy disks, you won't have the enhanced CD Player or the impressive AVI sample files. You'll have to rustle up copies of the supplemental disks to get CD Player. (There's an order form in your Windows

Quick Results

- **Tune your multimedia devices.** Call up the Multimedia applet in the Control Panel and flip through the different tabs for Audio, Video, MIDI, and CD Music. You can easily adjust default volumes and select external MIDI instruments for playback.
- **Use 16-bit color for video playback.** If you want high-quality video playback, be sure to switch your monitor to 16-bit color (right-mouse-button click on the desktop, select Properties, then the Settings tab, and choose High-Color from the Color palette). Otherwise, colors will look blocky and inaccurate. You will have to restart your machine for this adjustment to take effect.
- **Check your multimedia devices and drivers.** If you want to take inventory of the multimedia-related devices and software installed on your machine, click on the Multimedia applet in the Control Panel, then click on the Advanced tab. You'll get a graphical display of multimedia components, similar to the Device Manager's, and the ability to adjust properties for each of them.
- **Make music to match your mood.** To configure any of the audio devices on your PC, open the Multimedia Control Panel and choose the Advanced tab. Sound-card drivers can be turned on and off, and you can rename them with user-friendly titles. Instead of calling it "Audio for Creative Labs' Sound Blaster," for example, you can call your sound-card driver "My Sound Card." You can also give user-friendly names to your MIDI, Mixer, and Line-Input devices.

95 box, or call 800-426-9400 in the United States, or your local Microsoft office outside the United States.) To install it, put Supplemental Disk 1 in your floppy drive, click on Start, Settings, and Control Panel, then double click on Add/Remove Programs and bring up the Windows Setup filecard. Click on Have Disk and type the floppy drive's letter (such as A:). Choose Audio CD Player and click on Install.



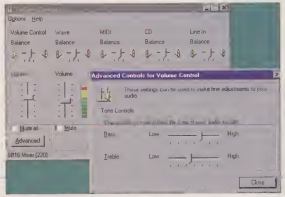
You want to get as much use as possible from your CD-ROM drive under Windows 95.

Enhanced CD—or CD-Plus, as the music industry (and most of the sentient universe) calls it—provides the ways and means. It's a new type of audio CD-ROM format that uses the empty space on the typical audio CD to store computer stuff like liner notes, music videos, Web links, advertisements for upcoming attractions, interviews, and maybe even a copy of Willie Nelson's tax returns. There's a technical glitch, though. Music CDs are

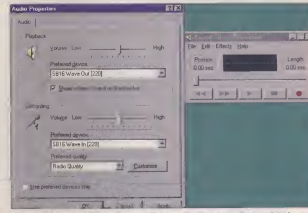
SUPERTIP **Temporarily Disable Autorun**

When you insert a CD into your CD-ROM drive, Windows 95 checks for a file called AUTORUN.INF in the CD's root directory. If one exists, Windows 95 runs it. This Autorun capability comes in handy when you put a CD into the drive, because you generally want to run whatever program is on that CD. But sometimes Autorun gets in the way. For example, if you're trying to install new Windows 95 programs from the distribution CD, and the installation routine tells you to "Insert the disk marked Windows 95 CD," the installer will get the files it wants—but you'll be left with that big "Windows 95 Tour" screen. To disable Autorun, press the Shift key while inserting a CD into your drive. Hold the key until the light on the front of the drive stops blinking (maybe for a minute or more). This Autorun trick works with audio CDs, too: Holding the Shift key while inserting an audio CD into the drive will prevent the CD from playing, regardless of the Play setting.

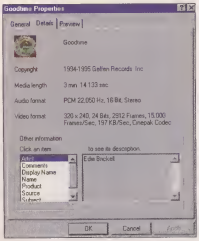
GUIDED TOUR ADDING **AUDIO** TO YOUR COMPUTING EXPERIENCE



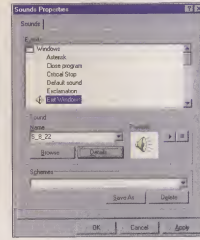
Sound Off: To adjust volume and tone for sound cards, double-click on the speaker icon located on the toolbar, then select Options, Advanced Controls, and click on the Advanced button.



Recording in Progress: Recording sounds couldn't be easier—just plug in a microphone and click on Start, Programs, Accessories, Multimedia, and Sound Recorder.



More Info: Windows 95 lets you store and view a large number of details for AVI and other types of multimedia files, including the audio-sample rate and video-compression method. Just choose Properties, then Details.



System Sound: Assigning WAV-file sounds to events—and storing the settings—is as simple as clicking on Start, Settings, and Control Panel, and then double-clicking on Sounds. You can then select an event and assign a sound to it.

Windows 95: CD-ROM Installation Tips

laid out in tracks: The first song is located on Track 1, the second is on Track 2, and so on. CD-ROM discs, on the other hand, contain all their data on a single track, in what amounts to Track 1. When you put a CD-ROM into an audio CD player, the audio CD player "plays" the computer data on Track 1 as though it were a song. The result is either silence or the obnoxious *bzzzzz* of white noise.

The technological solution to this dilemma comes via multisession CDs—the most common of which are Photo CDs—which can store different groups of data in separate areas called sessions. Session 1, for example, might contain all the digitized pictures from one roll of film, while Session 2 might hold photos from a different roll.

The Enhanced CD format—which has the backing of such entertainment heavyweights as Sony, Philips (who invented the technology), Universal/MCA, Warner Brothers, EMI, and even (gulp!) Apple Computer—uses the multisession concept to let music reside in Session 1, Tracks 1 to 99, and computer data on Session 2 and beyond.

When you put a music CD in a Windows 95 PC, Windows 95 looks at Track 1, determines that it's working with an audio CD, and kicks in the audio CD Player. If you load an Enhanced CD, the computer sees that there's audio on Session 1 and computer data in Session 2, and plays the audio portion as though it were a normal audio CD, and the data portion as though it were a data CD.



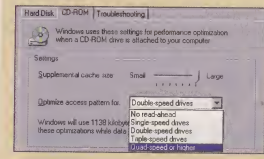
Like everybody else, you probably use your CD-ROM drive to play your favorite music more than you do to run your favorite multimedia encyclopedia. Windows 95's CD Player makes that easy to do. Once your CD-ROM drive is attached, the first thing you'll want to do is play an audio CD. Thanks to the impressive CD Player software included with Windows 95, you'll feel like you're sitting in front of your trusty stereo, instead of your cantankerous old PC. To use CD Player, first open the View menu and choose the Toolbar option. A group of handy icons will appear at the top of the CD Player. Each button represents a common play function such as Random, Multidisc, and Intro. In addition, you can create and edit playlists for CDs. Choose Edit Play List from the disc menu to begin. A dialog box will appear with spaces for the names of the album and artist. Tab to the bottom space on the dialog box and enter the names of the songs as they're listed on the CD cover. Each time you hit the Enter key you'll be prompted for the next song title. Moreover, if there is a song on the album you don't like, don't enter it into the playlist and the CD player will automatically skip it.

SUPERTIP **Make MIDI Work for You**

Windows 95 makes adding a new MIDI instrument or changing your current MIDI configuration easier than, say, tuning a piano. Click on the MIDI tab in the Multimedia Control Panel to start. If you're adding an external MIDI instrument, just click on the Add New Instrument button to bring up the MIDI Installation Wizard. But be forewarned: This won't work unless you have an instrument already connected to your sound card's MIDI port. If you have more than one MIDI instrument—a sound card and a keyboard, for example—you can assign each MIDI channel to a different device by first clicking on the Custom Configuration radio button and then clicking on the Configure button.

HOT TIP CD-ROM **SPEEDUP**

Get Your CD Drive to Scream: Changing the settings in Windows 95's CD File System can significantly improve performance. To change the settings, right–mouse-button click on My Computer and choose Properties. Click on Performance and then on File System to bring up the CD-ROM tab. Set the Supplemental cache size to Large. Then set the Optimize access pattern to show whatever type of CD-ROM drive you're using (single-speed, double-speed, and so on). If you have 16MB of RAM or more, consider using the quad-speed setting, regardless of your drive's actual speed.



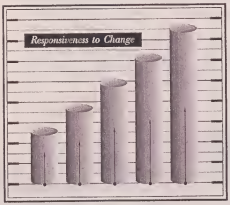


You've had some bad experiences trying to install a CD-ROM drive, or another multimedia device, under Windows 3.1. Windows 95 will make you forget those days. Thanks to Plug and Play, Windows 95 will recognize your CD-ROM drive as soon as you install it, which means you should be able to play multimedia titles right away. To speed up your access to the drive, you can create a shortcut to it on the desktop. But remember to keep an eye on the icon, because every time you install a different disc, the icon will change to reflect the title that's in the drive. BENJAMIN F. MILLER AND WOODY LEONHARD

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Networking Smarts



One fact of modern computing is that you'll eventually connect to other computers. Whether through the Internet, on a LAN, or via modem, networking is something you'll have to do—most likely sooner rather than later. Under Windows 3.*x*, a lot of the network functionality seemed unrelated to the operating system, almost as if it were an afterthought. In Windows 95, networking is built in to the core of the operating system so that connectivity is an extension of everything you do, from file management to multimedia. Using a common setup process for each of the network functions—and one that is similar to almost all of the other Windows 95 configuration wizards—makes networking easy to implement and almost invisible to the user. Three important elements that make up Windows 95's Network Neighborhood are NetWare's client services, peer-to-peer services, and Internet or TCP/IP services. In each case, you need to know the differences between them only when you set up the networking components of your PC. After that, Windows 95 worries about those details for you.

Quick Results

• **Set up an instant network.** Thanks to Windows 95's built-in peer-to-peer networking functions, you can easily share files and printers in a small workgroup without a server. To set up your instant network, make sure all the computers are connected together and using the same network protocols (open the Network Control Panel to see what's currently installed on a given machine), and then select the File and Print Sharing button at the bottom of the Configuration sheet.

You can choose to share either files or printers or select both. Select the Access Control tab to define whether passwords will be required.

• **Check your network connections.** When you right-mouse-button click on the icon for any networked computer, you have easy and instant access to all of the most common network functions through a drop-down menu. With this one click you can log in, log off, or find out how you are logged on to a particular server or peer client. Choose Properties from the menu to find out a server's name, the network operating system it's using, and how many users are currently connected to it.

• **Connect on the fly.** Even if you're not logged in to a particular server, you can still access any of the computers you're connected to through any of the Windows 95 common dialog boxes. Start your favorite application, and then open a file from a network drive. If you aren't already connected to that drive, a log-in dialog box will appear, and you can sign on to that server without leaving the application you're working in.



You currently work on a NetWare-based network. You're not sure how to set up and configure Windows 95 so that it works with your NetWare server.

Creating a log-in script for a NetWare client used to be a cryptic process requiring at least a working knowledge of NetWare. Windows 95 makes networking very easy—in fact, it's no harder than installing a modem. You use a common control panel for NetWare client setup, regardless of the protocol or client service you need. If you're installing Windows 95 over your existing NetWare configuration, Windows 95 will automatically detect the network protocols you're using and install them for you. If you're installing the NetWare client for the first time, Windows 95 will detect your network card (even if it's not a Plug and Play card), and prompt you for the appropriate information—for example, the type of network you're running on and the protocols you need to connect to the network.

The easiest way to connect a computer to a NetWare server is by installing the 32-bit, protected-mode NetWare client service. But Windows 95 can use real-mode drivers (NetX, open data-link interface, or Virtual Loadable Module) to connect to a NetWare server. These drivers need to be loaded into memory via DOS-type log-in scripts before Windows 95 starts. Also, when you configure Windows 95 to run in this environment, you'll need to use the older Windows 3.*x* NetWare drivers, not the NetWare client that's provided with Windows 95.

Despite the fact that the Windows 95 control panel doesn't look or feel anything like the DOS-based NetWare log-in scripts of yore, it retains all the same functionality and power. The control panel even supports all of the NetWare command-line instructions found in NetWare's Public folder.

If you want to configure or administer the network the hard way, open a DOS prompt and go to the Public folder on your NetWare server, and then run SYSCON or PCONSOLE from the DOS command

line. To do it the easy, Windows 95 way, open the Public folder in Explorer and double-click on the NetWare utility you want to run. You can even create a shortcut to your favorite network administration tool.



You work in an office without a server, but you want to connect your workgroup's PCs.

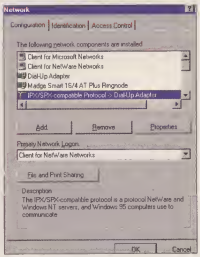
For peer-to-peer networking, Windows 95 adopts the efficiency of Windows for Workgroups 3.11 and seamlessly integrates it into the Windows 95 user interface and the Windows 95 networking model. One of the best features of Windows 95's peer networking is a much improved security scheme. Now each user can share file and printer resources at either the user or the resource level. User-level security means that the owner of a PC can decide who can and cannot have access to his or her computer and what rights each person will have once they've connected. With resource-level security, a user can determine which of his or her resources to share with all the other members of the workgroup.

Under Windows 95, peer-to-peer networking is also a little more flexible because it lets you establish peer-to-peer connections between multiple NetWare clients that are running over an IPX/SPX or a TCP/IP. In Windows for Workgroups, you had to install Microsoft's default network protocol, NetBEUI.

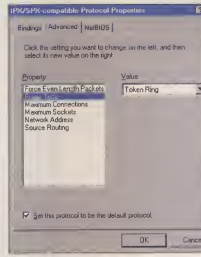
SUPERTIP **You Can't Do Remote TCP/IP**

With Windows 95's excellent dial-up networking capabilities, you have an easy way to make a fast Internet connection from your home, right? Wrong. Unfortunately for home surfers, Windows 95 cannot transfer Internet Protocol (IP) addresses over a dial-in connection. No IP, no Internet. If you want this kind of IP routing functionality, you need Windows NT to act as a Remote Access Server.

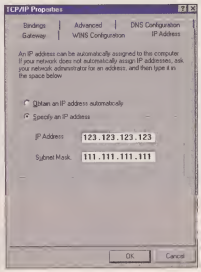
GUIDED TOUR MAKING NETWORK CONNECTIONS



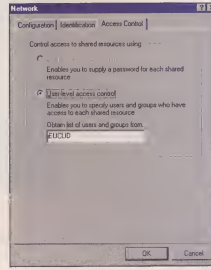
Control Your Network: With the Network Control Panel, you can easily install, remove, or configure any part of your network in a familiar environment. Installing a new network protocol is no different from installing a new printer.



Easy NetWare: In the Protocol Properties sheet, you can just point and click to change your network configuration. To get there, choose Network Control Panel, double-click on your network's protocol, and choose the Advanced tab.



Easy Internet: Setting up TCP/IP networking protocols for Internet access is a snap in Windows 95. Open the Network Control Panel and select TCP/IP from the list of installed components—it takes less than five minutes to add connectivity.



Share and Share Alike: Having different security levels lets you create a peer-to-peer network that suits your needs. You can even change the settings depending on the resource you want to share.



You used Windows for Workgroups to provide maximum interoperability between you and your network. You want to be certain that Windows 95 will afford you that same amount of connectivity and control.

Windows 95 can do everything your Windows for Workgroups client did—and more. For example, under Windows for Workgroups, you never had to worry about losing your connection. If one of your network peers was shut down for some reason, you wouldn't lose connectivity to the network, just to that single computer. Windows 95 does that as well, and it extends the functionality to a client-server–like model. So, if by some unfortunate circumstance your server should crash, your Windows 95–equipped PC will keep going. And, more important, when the server becomes available again, Windows 95 will automatically connect, without your ever knowing it.

If you know the right trick, Windows 95 also lets you find files on networked computers as easily as it lets you find them on your own hard drive—without ever making you leave the application you're in. What you need to do is create a pointer for every computer or drive on your network that you connect to regularly. To do this, right-mouse-button click on the drive or computer and choose Map Network Drive. If you're on a NetWare network, choose a drive letter (don't do this if you're on a Windows NT or Windows 95 peer network) and select Reconnect at Logon. Now, every time you reboot, the icons representing those drives will be found when you open the My Computer icon. The next time you need to find a file on a networked computer, select Find from the Start menu and then Files or Folders. When the Find dialog box comes up, click on the Look in List box and you'll see all the drives you mapped, ready to be searched.

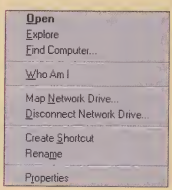
Once you've mapped the drives, you can handle them just as you would a local drive. Make a shortcut by right-mouse-button dragging them from My Computer to your desktop or into any folder. If you make a shortcut to any of these drives inside the Windows Send To folder, you'll see them represented in the Send To options when you right-click on any file.

SUPERTIP **Won't You Be My Network Neighbor?**

You can right-mouse-button click on the servers listed in Network Neighborhood's Explorer window to administer and connect to them, but you can also have access to more global network commands by right-clicking on the upper-left corner of the Network Neighborhood window. With those commands, you can globally assign or change drive mappings and find out which servers—regardless of how many—you're connected to. To ease access to commonly used network drives, right-click on them in the Network Neighborhood window and drag them to the desktop, and you'll be able to create a shortcut that you can double-click on for instant access.

HOT TIP NETWARE **DRIVE MAPPING**

Drive Mapping Tames NetWare: With the click of a right mouse-button, you have all the essential network commands at your fingertips. Select a NetWare drive in Network Neighborhood, then use the Who Am I command in the File menu to find out what computers you are connected to. Log in to connect to a server, and log off to disconnect from a server. Also use the right-mouse-button menus to map a networked drive directly onto your desktop or make it visible as soon as you open My Computer.





You want to know how to connect to the Internet.

Everyone wants to get on the Internet, and Microsoft is fully aware of that. Unlike Windows 3.1, in which adding Internet capabilities to your computer was a painful and frustrating process, Windows 95 makes installing TCP/IP networking protocols and establishing an Internet connection as easy as talking to your local network or dialing in to an online service.

Windows 95 provides you with two ways to configure your Internet Protocol (IP) addresses. If your network supports dynamic host configuration protocol (DHCP), all you have to do is open the Network Control Panel and select TCP/IP from the list of installed network components. Click on the Properties button to bring up the TCP/IP Properties dialog box. Click on the IP Address tab, then choose the Obtain an IP Address Automatically option. Click on OK and you're done.

If you don't have DHCP as an option, setting your IP address requires a little more work, but not any more than it takes to set up a CompuServe account. Your network administrator needs to supply you with a series of IP numbers to type into the allotted spaces. The three sets of numbers you need are an IP address and Subnet mask, a Gateway address, and one or more Domain Name Server addresses. Once your TCP/IP service has been configured, all you have to do is reboot your system and you can start surfing the Net. **BENJAMIN F. MILLER**

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Communications



These days, there's a lot of talk about communications software. Between Mail API (MAPI), vendor-independent messaging (VIM), telephony API (TAPI), fax, and voice mail—not to mention the Internet and online services and everything in between—there's too much confusion and too little real communication. Windows 95 and, in particular, Microsoft's Exchange, the universal e-mail client, may make things a lot easier. But there are still roadblocks to break through. And where do you look for road signs? The guidebooks aren't helpful enough: They assume you already understand what you're trying to look up, but the signposts are unfamiliar and much of the territory is unmarked. What you need is a good road map to point you in the right direction.



You want to know the best way to use Windows 95 to communicate with other PCs and online services. Windows 95 communications applications come in five flavors. The two most important are Exchange, Microsoft's faltering first step in the universal-mailbox wars; and the Internet Jumpstart Kit, which includes Internet Explorer, a good-to-very-good World Wide Web browser created by the Webmeisters who brought you Mosaic. Two lesser players are HyperTerminal, a usable, albeit minimalist, modem communications program developed by Hilgraeve (think of it as a 32-bit clone of the free communications program you probably got with your modem); and a rudimentary phone dialer called, well, Phone Dialer. Although its current incarnation isn't very exciting, Phone Dialer may have a future role as a slave to other Windows 95 programs, notably the contact manager in Schedule Plus 7.0. Also, as TAPI-based programs start to become commonplace, Phone Dialer will undoubtedly be used a lot more.

The fifth piece of Windows 95 communications software, Dial-Up Networking (known to propeller heads as Remote Access Service, or RAS), allows dial-up access to your computer and its network. It's accessible from My Computer's Dial-Up Networking folder. Clicking on Connections, then Dial-Up Server, starts the remote-server process while a wizard guides you through the process of setting up a remote client. Once the remote client has been created, Network Neighborhood treats it as just another networked computer. The entire process is simple and streamlined. However, there are limitations: Dial-Up Networking supports only one modem, so only one person at a time can gain access to the server through the machine hosting the remote dial-in session; and that same modem ties up the phone line for incoming calls, so it can't be used for inbound faxes or voice mail.



The communications tools are spread across Windows 95's start-up disks, so it's sometimes more difficult to find the components than it is to use them. Exchange ships with the Windows 95 CD-ROM or setup disks. The components of Exchange that handle faxes, Microsoft Mail, and the e-mail portion of

Quick Results

- **Jump-start the Internet.** If you're on the Internet, or plan to get on soon, get Microsoft's Internet Jumpstart Kit, either from ftp.microsoft.com or with the $50 Microsoft Plus utility pack. The Internet Setup Wizard will save you hours of frustration, and Microsoft's Internet Explorer is an excellent (and free!) alternative to Netscape 1.2.
- **Create fax cover-page logos.** Don't settle for the default fax cover pages—customize them or create them from scratch using the Fax Cover Page Editor in Windows 95. You can generate logos or other graphic elements using the app's built-in tools or by copying in bitmap (BMP) files. If the graphic you want to use isn't in BMP format, open the application the image was created in, copy the image to the Clipboard, switch to the Cover Page Editor application, and paste it in.
- **Customize your e-mail notification.** Your Exchange Inbox is configured to give you an audio alert when new mail has been delivered to you. If you find that noise annoying, you can have Exchange pop up a message instead. Open the Inbox, Select Tools, then Options, and click on the General tab. Then check off Play a Sound, and check the Display a Notification message box.
- **Get speedier remote access.** Save yourself connect time when you're logged in to your network by using the Dial-up Networking tool. Map the drives you frequently access (using the Map button in Network Neighborhood), so that as soon as you make the connection, you can select those drive letters from My Computer. To save even more time, open My Computer before you start dialing.

Microsoft Network also come on the setup disks. If you chose any of those three components when you installed Windows 95, Exchange came along for the ride. If you declined on all three, double-clicking on the Inbox icon on your desktop will start the Exchange Installation Wizard. HyperTerminal and Phone Dialer are also on the Windows 95 start-up disks. If you opted for a Typical installation, only HyperTerminal is on your hard disk; you'll have to snag Phone Dialer by running the Control Panel's Add/Remove Software applet.

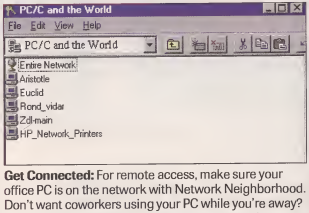
The Exchange component that lets you send and receive CompuServe mail is on the Windows 95 CD-ROM. Look in the Drivers, Other, Exchange, COMPUSRV folder for a README file and an installer. Once the CompuServe installation routine is done, you can configure and administer it exactly the way you would any other Exchange service. For example, you can tell it how often you want it to check for new mail.

The Internet Jumpstart Kit is available as part of Microsoft Plus, but if that's the only reason you have to buy Plus, save yourself some bucks: It's also available free via the Internet from ftp.microsoft.com and http://www.microsoft.com. Finally, both Dial-Up Networking and the Internet mail client for Exchange are only available with Plus.

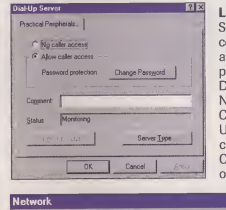
SUPERTIP **Stupid CompuServe Tricks Add Life to Messages**

Microsoft Exchange's CompuServe e-mail client has a unique feature that lets you send and receive fully formatted Rich Text Format (RTF) messages via CompuServe mail as long as your recipients use Exchange or any other RTF-capable mail reader. If they don't, they'll get messages containing text without the formatting and an attached enclosure with the formatting data. To enable this feature, right-mouse-button click on the Inbox, select Properties, highlight CompuServe Mail, and click on the Properties button in the Services dialog box. Then choose the Default Send Options tab and check Send using Microsoft Exchange's RTF.

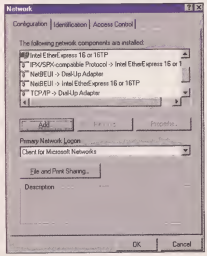
GUIDED TOUR USING DIAL-UP REMOTE ACCESS



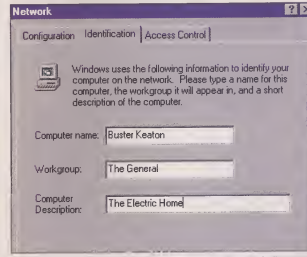
Get Connected: For remote access, make sure your office PC is on the network with Network Neighborhood. Don't want coworkers using your PC while you're away? Right-click on the desktop, pick Properties, and set up a password-protected screen saver.



Let Yourself In: Set up the office computer to answer the phone. Click on Dial-Up Networking, Connections, Dial Up Server, then check the Allow Caller Access option.



Share Protocols: Both the office and remote computers need to have at least one dial-up communications protocol in common. Open the Control Panel's Network box and use the Configuration tab to verify your settings.



Identify Yourself: Learn your office computer's "name." Click on Start, Settings, Control Panel, then double-click on Network. Bring up the Identification tab and write down the exact name for future reference.



Microsoft has claimed that Exchange will be the universal mailbox for all types of communications, but that won't actually be the case for a while.

In the meantime, you can use Exchange's fax features right away. In the future, Microsoft's Exchange will serve as the hub for our interaction with much of the phone-connected universe: faxes, voice messages, groupware applications, and, of course, e-mail in all its infinite variety. Unfortunately, it will take some time for the rest of the software world to provide Exchange-based utilities. Until that day arrives, Exchange's fax feature will probably prove most useful (unless you already have a superfancy fax package). Exchange's Microsoft Mail client will be a no-brainer to install and administer for Mail users, and its Internet and online-service mail features are most welcome—if only because you don't have to learn how to use yet another editor. In fact, Exchange might be the most important new feature in Windows 95.



You have an Internet account, but you're not sure how Windows 95 can get you to the Web.

If you're not already on the World Wide Web, Windows 95 should speed the process by greatly easing the setup required to access the Internet. The Internet Jumpstart Kit's Setup Wizard, included with the $50 Microsoft Plus utility pack, doesn't weigh anything and is infinitely easier than setting up Internet access manually. Microsoft's Internet Explorer works equally well over direct connections and through SLIP or PPP lines to the Internet. And, in case you were wondering, it doesn't require that you sign up with Microsoft Network—it works with any Post Office Protocol (POP3)–compliant Internet provider.

The best reasons to use Exchange and Internet Explorer are that, with a few glaring exceptions, they both behave like extensions to the Windows 95 desktop: You can drag and drop shortcuts and mail them, and embedding works the way you would expect. The classic example is that if you find a Web site that you know will interest a friend, you can create a shortcut for that Web page and embed it in an Exchange message. When your friend gets the message, all he or she has to do is double-click on the embedded shortcut, and Internet Explorer will automatically launch and take your friend to that Web site. Right-mouse-button clicking on messages brings up the usual context-sensitive menus for changing Properties and the like. Also, these two applications work together very easily because settings used in Exchange (stored in the Registry) are also used by the Internet Explorer. For example, teaching Exchange to recognize .AU files automatically teaches Internet Explorer the same thing.

To have Internet e-mail handled entirely by Microsoft's Exchange, you simply need to add the Internet e-mail client.

WOODY LEONHARD

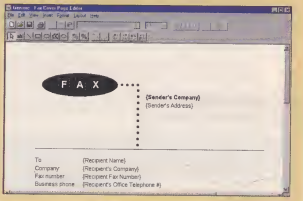
SUPERTIP **Don't Download Unnecessarily**

Microsoft's Exchange has a neat feature that lets you look at the headers of incoming messages without downloading the messages. It's called Remote Mail, and you can reach it by double-clicking on the Inbox, selecting Remote Mail from the Tools menu, choosing a service, then clicking on the Connect icon, which is the first (leftmost) icon on the toolbar.

Remote Mail dials your online service, retrieves the headers of all waiting mail (including the sender, title, file size, and anticipated download time), and then sits there with the clock running, waiting for you to do something. You can mark a message for downloading and, in a separate action, have it downloaded. Or you can click on the Deliver Mail icon (on the toolbar, the fourth icon from the left) to have all pending mail uploaded. But in many cases it will take you longer to read the headers and make decisions on whether or not to download than it would to simply download all the messages. You can change the default behavior on some services by clicking on Tools, Services, then picking the service and clicking on Properties.

HOT TIP CREATE CUSTOM **COVER PAGES**

Fax Cover: The built-in fax cover pages that ship with Windows 95 are of the dull, buttoned-down corporate variety. Fortunately, Microsoft has included an editor for making your own fax cover sheets that offers a solid set of fax features. The Fax Cover Page Editor lets you create cover sheets that include the time and date the message was sent; the name, address, and phone number of the sender and/or recipient; a cc: list; the total number of pages; embedded graphics; and OLE objects. The Cover Page Editor is located in the Accessories, Fax folder under the Start menu.





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Mobile Computing



They should hand out a special medal to anyone who has successfully figured out a way to get Windows 3.*x* working on a notebook. If you've earned the Croix de Windows 3.*x*, treasure it as a collector's item, because road warriors who upgrade to Windows 95 will face far fewer hassles.

For starters, the new operating system is much more intelligent about handling multiple configurations. If you use a docking station or a port replicator (or even a fistful of cables) to connect to devices on your desktop and corporate network, use the Hardware Profiles tab on the System Properties sheet to create a new configuration. Give it a name, then restart the PC. During boot-up, Windows asks you to choose a configuration, then the Plug and Play software rescans your system and checks which hardware belongs in the new configuration.

You can create as many configurations as you like, and you can fine-tune the configuration details for each device by checking or unchecking its Device Manager property sheet.

Power management is easier, too, thanks to built-in support for the Advanced Power Management (APM) 1.1 standard. You shouldn't have to mess with PC Card devices, either, although installing the drivers is trickier than it first appears. And keeping files in sync across two PCs is finally possible without third-party software, thanks to the Briefcase utility.

Quick Results

- **Run the PC Card Wizard.** In a triumph of conservatism, Windows 95 installs the 32-bit PC Card (PCMCIA) drivers but doesn't turn them on. Open the Control Panel and double-click on the PC Card icon to replace your real-mode drivers with the 32-bit variety.
- **Add the PC Card icon to the Taskbar.** You'll find the requisite check box when you run the PC Card applet in the Control Panel. If your only PC Card is a modem, you don't need to display this icon. Otherwise, check the box.
- **Check the power management.** If Windows 95 can't interpret the power-management messages from your BIOS, it might turn it off completely. To set things right, open the Device Manager, select Advanced Power Management (APM) Support from the System Devices section, and click on the Properties button. On the Settings tab, check the box to enable power-management support. If necessary, check the Force APM 1.0 Mode box.
- **Put Suspend on your Start menu.** Open the Control Panel and display the Power properties. In the Suspend Command Options area, specify whether you want to see the command always, sometimes, or only when your portable computer is undocked. The command appears just above Shut Down.
- **Get connected.** You have two built-in options for linking two PCs. You can use Direct Cable Connection, which requires a serial or parallel cable, or a faster network connection, if your notebook has a network adapter. Whichever one you choose, test the connection *before* you need it. You don't want to miss your flight while you troubleshoot the connection.



Even after setting up Windows 95, your DOS/Windows PC Card drivers will still be there. But don't remove them just yet.

First things first: Use the PC Card Wizard (found in the Control Panel) to replace the real-mode drivers with their 32-bit updates. Don't delete the old drivers, though; you may need them later, if you have to boot up to a command prompt for emergency system maintenance. In fact, now would be a good time to update your Windows 95 start-up disk.

Find the emergency disk and copy the drivers and any support files from the hard disk to the start-up floppy disk. Make sure you add the appropriate references to these drivers in the start-up files (CONFIG.SYS and AUTOEXEC.BAT) on the disk.

Resist the urge to clean up the start-up files on your hard disk. Leave the driver references there, but comment them out by putting REM in front of each line. You can remove the comments and restore the real-mode PC Card support later if you have trouble.



PC Card support had to be grafted onto Windows 3.1 and often didn't work well, especially if you used multiple cards. You need to know if Windows 95's Plug and Play support eases the process.

Inserting a PC Card under Windows 95 requires no special skills. Leave the system running if you'd like, or insert the card and then power up. Either way, Windows 95 will detect the new card and add support as needed if you have a Plug and Play BIOS in your laptop. If this is the first time you've used the card, you might be prompted for the Windows disks to load a new driver. After the prompt,

Continued on page 192

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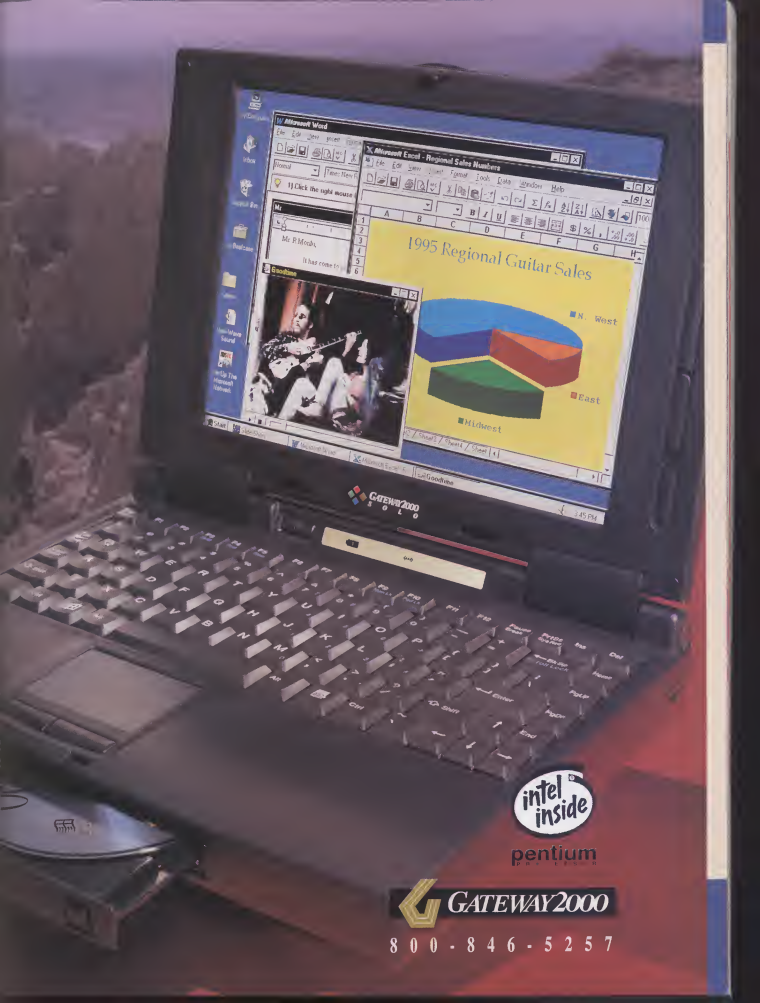
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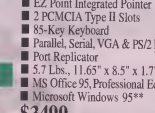
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Access vs. Alpha Five

50 Lines of Code

Microsoft Access

If this looks tough, you may want to pick up a few books about Access programming.

```
' From the general declarations
   Dim source_id As I
   Dim start_quantity As Double

' setting the values before the fields.....
Sub quantity_BeforeUpdate (Cancel As Integer)
   source_id = Me![ItemID]
   start_quantity = Me![Quantity]
End Sub

' After update
Sub quantity_AfterUpdate ()

'declaring the variables used in this funciton.....
Dim CURRENT_db As Database
Dim ON_HAND_dbl As Double
Dim PRODUCTS_rst As Recordset
Dim VAL_var As Variant
Dim NEW_PRODUCTID_lng As Long
Dim NEW_QUANTITY_lng As Double
Dim product_qdf As QueryDef

' getting the new values.....
NEW_PRODUCTID_lng = Me![PRODUCT_ID]
NEW_QUANTITY_lng = Me![Quantity]

Set current_dbf = dbEngin.Workspaces(0).Database(0)

NEW_PRODUCTID_lng = Me![PRODUCT_ID]
NEW_QUANTITY_lng = Me![Quantity]

'undoing the changes that where made to the products database
Set product_qdf = dbcurrent.OpenQueryDef("Undo_previous_update")
product_qdf.Parameters(0) = Quantity_dbl
product_qdf.Parameters(1) = PRODUCTID_lng
   product_qdf.Execute
      product_qdf.Close

         'sending new update to the products database
         Set product_qdf = dbcurrent.OpenQueryDef("Update_products")
         product_qdf.Parameters(0) = NEW_QUANTITY_dbl
         product_qdf.Parameters(1) = NEW_PRODUCTID_lng
               product_qdf.Execute
                  product_qdf.Close

                     End Sub

               'after del confirm ======
                  Sub Form_AfterDelConfirm (Status As Integer)

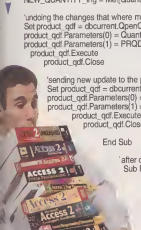
                     Dim Val_var As Variant
                        Dim products_qdf As QueryDef
                        Dim current_dbf As Database

                        Set dbCurrent =
                     dbEngine.Workspaces(0).Databases(0)

                           var_val = RenumberDetail()

                  'To update the inventory,
                  ' run the query to add the old items back in
                     Set  product_qdf =
                  Current_dbf.OpenQueryDef("undo_previous_update")
                     qdfInventory.Parameters(0) = Quantity_dbl
                     qdfInventory.Parameters(1) = productid_lng
                     qdfInventory.Execute
                        qdfInventory.Close

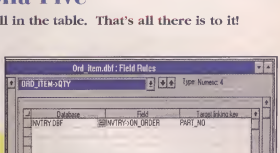
                     End Sub
```



One Easy Table

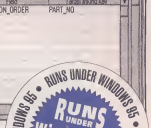
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ADC

Windows 95: Mastering PC Cards and the Briefcase

Continued from page 186

Windows 95 will load the driver automatically, when it detects the card.

Removing a PC Card is trickier, especially if it contains data (a hard disk, say) or if it controls access to data (a network card). When you physically remove this type of card without first notifying Windows, you risk losing data that's in a cache and hasn't yet been written to disk. In the case of a network, severing a connection unexpectedly can cause a complete system hang-up. Here are some much safer options: (1) Left-mouse-button click on the PC Card icon on the tray at the right side of the Taskbar to shut down support for a currently installed device and remove the drivers from memory. This is by far the safest way to disconnect from a network. To reload those drivers, remove and reinsert the PC Card. (2) Right-mouse-button click on the PC Card icon to see a menu that lets you hide the PC Card icon. (3) Double click on the PC Card icon to see the full suite of PC Card options, including one that lets you turn off the sounds associated with inserting and removing a card. (4) Put the notebook into Suspend mode (in the Start menu on portable machines) before removing a device like a hard drive. When Windows shuts down, it flushes cached data to disk.

SUPERTIP

Print Anywhere

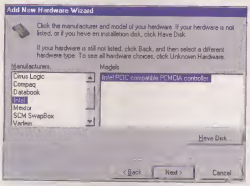
You're cruising at 37,000 feet. Your Hewlett-Packard LaserJet printer is at sea level. Your parallel cable doesn't exactly extend that far. Problem? Not at all. As long as the printer you normally use has been set up on your notebook, Windows will accept the print job, store it in the print spooler, and defer printing until the next time it detects an active connection to the printer. At that time, you can print the jobs, defer printing a little longer, or cancel the deferred jobs altogether.



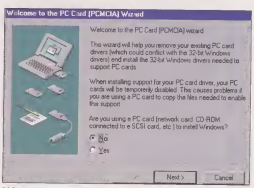
The Briefcase looks like a great way to solve file-synchronization problems. But there's a catch.

In the Windows 95 help system, the Briefcase gets only a small mention. Here's what nobody tells you: A Briefcase acts just like any Windows folder, with some notable additions. All synchronization information is contained in a hidden file called Briefcase Database, which is stored in the Briefcase. Another hidden file, DESKTOP.INI, contains crucial information that tells Windows how to handle the Briefcase. If either of these files is

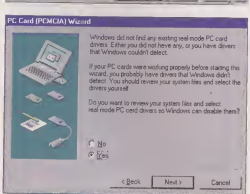
GUIDED TOUR GETTING STARTED WITH PC CARDS



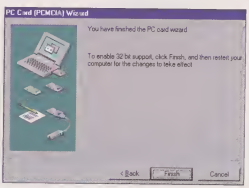
Show Your PC Cards: You have to configure Windows 95 in order to run PC Cards. Simply double-click on the Add New Hardware Control Panel and choose PCMCIA Controller.



Wizardry: Double-clicking on the PCMCIA Control Panel launches the PC Card Wizard, which installs 32-bit drivers for the devices.



No Real Mode: The PC Card Wizard checks your system for real-mode PC Card drivers. If it finds them, it suggests that you remove them.



All Done! When the PC Card Wizard finishes, all you have to do is reboot your system and enjoy solid, virtual-mode PC Card stability.

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lost or corrupted, the Briefcase won't work anymore, although the files that reside within the Briefcase will still be usable.

Remember: The Briefcase is a file-management utility, not a full-strength file-synchronization tool. Don't expect it to keep the entire contents of your hard disk in sync with your desktop. Instead, limit your expectations and follow these guidelines: (1) Create Briefcases where you need them, give them descriptive names in place of the generic labels, then drag shortcuts to the desktop to work with. (2) Don't overstuff a Briefcase. Like the leather variety, overstuffed Briefcases fall apart sooner or later. Under Windows 95, storing more than 100 files in a Briefcase practically guarantees poor performance and system resource problems. (3) Don't even think about using a Briefcase with floppy disks. There's code in Windows to handle disks, but its inability to deal with multidisk sets makes it useless for most applications. (4) With slow links, such as a Direct Cable Connection, update the Briefcase locally, then copy it across the wire. The synchronization process will go much faster.

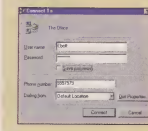


You've installed Dial-Up Networking but found that it takes a long time to connect to the information you need.

Assuming you're dialing in to a network server, the quick and seamless way to connect is to set up a shortcut on the desktop. Back in the office, while you're connected to the network, browse through the Windows 95 Network Neighborhood and find the folder or file you want to use. Press the right mouse-button and drag the folder or file to the desktop, then choose Create Shortcut(s) Here. Now, when you're connected to the network, double-clicking on the shortcut will take you directly to that location or file. If you're on the road, the same action will fire up the Dial-Up Networking connectoid (yes, that's really what it's called) and start making the connection for you. You tell Windows where you're dialing from, double-check the phone number, and click on OK. The rest of the process is automatic.

HOT TIP PASSWORD PROTECTION

Stay Safe: Windows 95 caches passwords by storing them in an encrypted format on your hard disk and unlocking the cache after you enter the master password at log-in time. Everything goes in the password cache—dial-up network connections, NetWare details, even your Microsoft Network password. If you're concerned about security—and you should be if you're carrying an easy-to-steal notebook—consider leaving crucial passwords uncached by unchecking the Save Password box. And guard your master password with your life.





You need to know how to dial out from different locations to make modem connections.

Assuming you're using an application that hooks into the Telephony Application Programming Interface (TAPI), you can save that information in the Location field and reuse it next time you hit town. (HyperTerminal and Dial-Up Networking both use TAPI.) Instead of manually entering the dialing prefix and calling-card information, use the Location Wizard to store your preference, then save it with a descriptive name. Be specific: *Plaza Hotel, NYC*, will jump right off the list next time you're lucky enough to check in there. And you'll get connected a lot faster. **ED BOTT**

SUPERTIP Use the Briefcase For Backups

If your office went up in flames tomorrow, would you lose all your data? Even a tape backup doesn't do you any good if it's stored near your PC. If you have a notebook and a way to connect it to your desktop, you have a perfect way to periodically back up priceless files and store them off-site. Best of all, it doesn't involve a lot of fuss. Here's what to do:

- Identify the files you absolutely, positively can't afford to lose. Keep the list small and manageable.
- Create a Briefcase file on your notebook, then drag the essential files from their original location on the desktop PC and drop them on the Briefcase icon. As long as you take your notebook home every day, you'll have a secure off-site storage strategy for these backed-up files.
- Keep a shortcut to this Briefcase handy and update the files every time the two machines are connected. It takes only a right-mouse-button click on the Briefcase icon and an Update All to automatically refresh your backups.

The Briefcase does not synchronize file content, by the way; it merely copies the most current version of the file either into the Briefcase or back onto the desktop drive.

You can also use this backup strategy to store up-to-date copies of important documents on a network file server. It requires fewer steps than a conventional backup program, it takes less time than copying all files indiscriminately, and the files are stored in a format that you can use immediately in the event of an emergency.

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Undocumented Secrets



OK, you've nailed down the basics, you've read (well, at least skimmed) the manuals, and you're feeling pretty good about your newfound Windows 95 skills. But to maintain your position at the top of the information food chain you need more—a few extra nuggets to impress your coworkers and strengthen your grasp on this new operating system. Here they are:



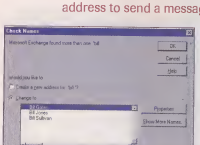
Finding the Pentium Bug: All the fuss over the Pentium has died down now, but there are still plenty of Pentium PCs out there whose numeric coprocessors can't be trusted with simple arithmetic. Fortunately, Windows 95 includes code that checks the integrity of your CPU's coprocessor. If it's one of the flawed Pentiums, you can disable that part of the chip while you wait for an upgraded CPU to arrive. Look in the Device Manager—you'll find the "Numeric data processor" entry under the System Devices heading. Click on the Properties button to run the coprocessor test and the Settings tab to see the results.



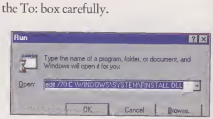
One-Click Access to the Control Panel: You can drag a shortcut to the Control Panel onto the Start menu, but that doesn't really save you much time. You still have to open a folder window, scroll through the list of Control Panel applets, and double-click on the one you want. The lightning-fast secret to instant Control Panel access is to install it as a system folder on the Start menu. When you do, you'll see the Control Panel on the Start menu, with each applet just a click away on a cascading menu. To add the system folder, right-click on the Start button and choose Explore from the shortcut menu. Right-click on any blank space in the right-hand Explorer pane and choose New, Folder. Rename the folder using this exact string:

Control Panel.{21EC2020-3AEA-1069-A2DD-0800ZB30309D}

Note that these are curly brackets, not square brackets or parentheses. Press Enter and close Explorer. Next, click on the Start button to see the cascading list of Control Panel applets. Warning: If you install a program that adds a new entry to the Control Panel, you'll need to re-create this shortcut; its contents won't be automatically updated.

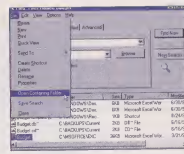


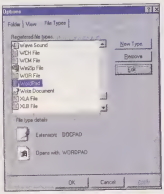
Streamlining Exchange's Address Book: The good news about the Exchange e-mail client is that you don't have to scroll through a lengthy address book or memorize a finger-cramping Internet address to send a message. But there's bad news, too. Exchange does its best to translate partial names into names it recognizes from your address book. And it uses the display name—the friendly name you create—rather than the sometimes arbitrary name the mail provider requires. To send a message to Bill Gates, for example, just type Bill. If there's more than one Bill in the address book, Exchange offers a list of alternatives, including the option to create a new address book entry. The bad news? If there's only one matching address, Exchange automatically sends the message to that address without asking you to confirm that it's the right one. That could be embarrassing if the only matching entry in the address book isn't the one you intended. The fail-safe solution? Click on the Check Names button before sending a new message, then check the names in the To: box carefully.



Drag-and-Drop Commands: It works to think of the Windows 95 Run dialog box as a miniature command prompt. But you're not sure how to attach a long, complicated pathname onto the end of a command. Just drag the filename from a folder window and drop it into the Run box. Windows tacks on the full pathname—including quote marks, if required—leaving plenty of room for you to add another command, a set of switches, or a crucial parameter.

One-Click Folder Access: After you've used the Windows 95 Find utility to track down an elusive file, you want to jump directly to the folder where that file is stored. There's the slow way—use the Explorer tree to browse through the directory structure until you find the right folder—but there's also a much faster way. In the Find window, pull down the File menu and choose Open Containing Folder. Windows will immediately open a window on the folder containing the selected file. This feature looks as if it was added to Windows 95 almost as an afterthought: You can't select more than one file, and the command is nowhere to be found on the right-button menu. But it's still a handy time-saver.

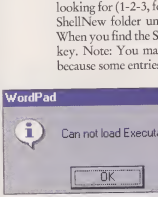




Extending Your Extension: Both Word for Windows and WordPad claim the DOC extension as their own, but the Registry can handle only one association per extension. You want to know how you can tell which app should open a particular DOC. The key is in long filenames. The 255-character limitation includes the extension, meaning you can conceivably have a filename of 20 characters and an extension that's 235 characters long. So save your WordPad files with an extension such as DOCPAD, and establish an association to that extension. To do so, select Options from the View menu of an open window, then click on the File Types tab, then on New Type.

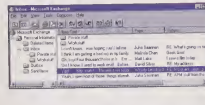
Cleaning Up Your New Menu: Some applications take liberties with the New option in the context menu (you know, the one you get when you right-click anywhere on the desktop or in a folder). You wonder if you really need the option to add a new Lotus 1-2-3 worksheet on that menu. Sure, the world has gone document-centric, but you may not want to jump on the bandwagon just yet. To remove unwanted items you'll need to hack the Registry. Select Start, Run, and type REGEDIT. At the Registry Editor screen, press Ctrl+F (Find), then type the string you're looking for (1-2-3, for example). When you find that string, see if there's a ShellNew folder under it. If there isn't, hit F3 to continue the search. When you find the ShellNew entry, you can remove it by pressing the Del key. Note: You may need to repeat this search-and-destroy operation, because some entries are repeated two or three times.

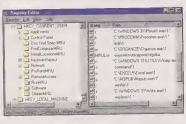




Hacking the Code: Programmers and other technical types who want to view or edit binary files are disappointed that Write is no longer included with Windows 95. Apparently, Microsoft wasn't too pleased with the freedom to reverse-engineer Windows programs that Write's binary viewing ability gave users. That's why WordPad can't edit binary files. But not all is lost. If you're installing Windows 95 over Windows 3.x, be sure to copy WRITE.EXE to a floppy disk or another directory before you start, because WordPad will overwrite it. Another way to edit binary files is to type edit /70 *filename* at the DOS prompt—the /70 sets the line width at 70 characters.

Previewing Your E-mail: You're drowning in e-mail and can't spare the time to read all of it. You want a way to preview your Exchange messages. In the InBox folder, click on View, Columns, and add the column Item Text to your view. Now you can see the first 20 characters of each message, or expand the column with the mouse to view more.





Tracking Your PC's Usage: If you go on vacation for a month and want to find out if anyone has been snooping around on your PC, Windows 95 has a way to help. Unbeknownst to most users, Windows 95 keeps a log of everything you do, including applications you run, documents you open, and servers you access (including remote servers, through the dial-up networking feature). Most of that information is kept in different areas in the Registry. To find it, select Start, Run, and type REGEDIT (for Registry Editor). Under the HKEY_CURRENT_USER entry, look for any folder labeled with MRU (Most Recently Used). RunMRU, for example, lists the applications that have been most recently run. Under the Network folder, look for a folder named Recent. And don't forget to check the Start menu for the Documents submenu, which lists all the recently opened documents.

ED BOTT AND YAEL LI-RON

Windows 95: Can It Deliver Hassle-Free Hardware Installation?

Plug and Play Exposed

SYNOPSIS

PRINTERS: *Windows 95 provides drivers for hundreds of printers, but does that ensure smooth installation?* **200**

VIDEO CARDS AND MONITORS: *You might not like what you see—or don't see.* **200**

SCSI AND CD-ROM: *Does Plug and Play put an end to the frustrations you have with SCSI cards when installing CD-ROM drives?* **201**

SOUND CARDS: *Say good-bye to sound card headaches.* **201**

FINAL ANALYSIS: *Is Windows 95's Plug and Play ready for prime time?* **202**

Everyone loves new hardware. Everyone hates installing it. That's why Microsoft made Plug and Play such a high priority in Windows 95. Microsoft promised that installing a new printer or CD-ROM drive would be as easy as screwing in a lightbulb. We put this claim to the test in *PC Computing*'s Usability Labs. It sounds too good to be true, and unfortunately, it is. The premise of Plug and Play is alluring: Windows 95 automatically detects and configures peripherals. And when conflicts arise, Windows 95 reconfigures the offending device or disables it, letting the system start. All the necessary hardware changes and software installations are done for you. All you do is physically install the hardware. The reality is that Plug and Play in Windows 95 isn't yet ready for prime time. When it works, you'll be dazzled; when it doesn't, you might be more confused than ever.

Our conclusions are based on exhaustive tests we conducted using a group of *PC Computing* readers who spent more than 200 hours in our Usability Labs. Each tester was asked to install a printer, video card and monitor, SCSI controller and CD-ROM drive, and sound card. Every tester was given a Plug and Play version and a regular jumper-and-dip-switch version of each peripheral. The Plug and Play products were installed in Compaq Computer's Deskpro 575 Plug and Play Pentium systems loaded with a close-to-final build of Windows 95. The legacy hardware products were installed in Compaq's Prolinea MT CDS 486 systems running Windows 3.11.

All of the peripherals came from leading companies—such as Adaptec, Creative Labs, Diamond Multimedia Systems, Hewlett-Packard, and NEC Technologies—that worked cheek-to-cheek with Microsoft during the development of Plug and Play in Windows 95. When you see our test results, you might wonder what will happen when you use peripherals from lesser-known companies.

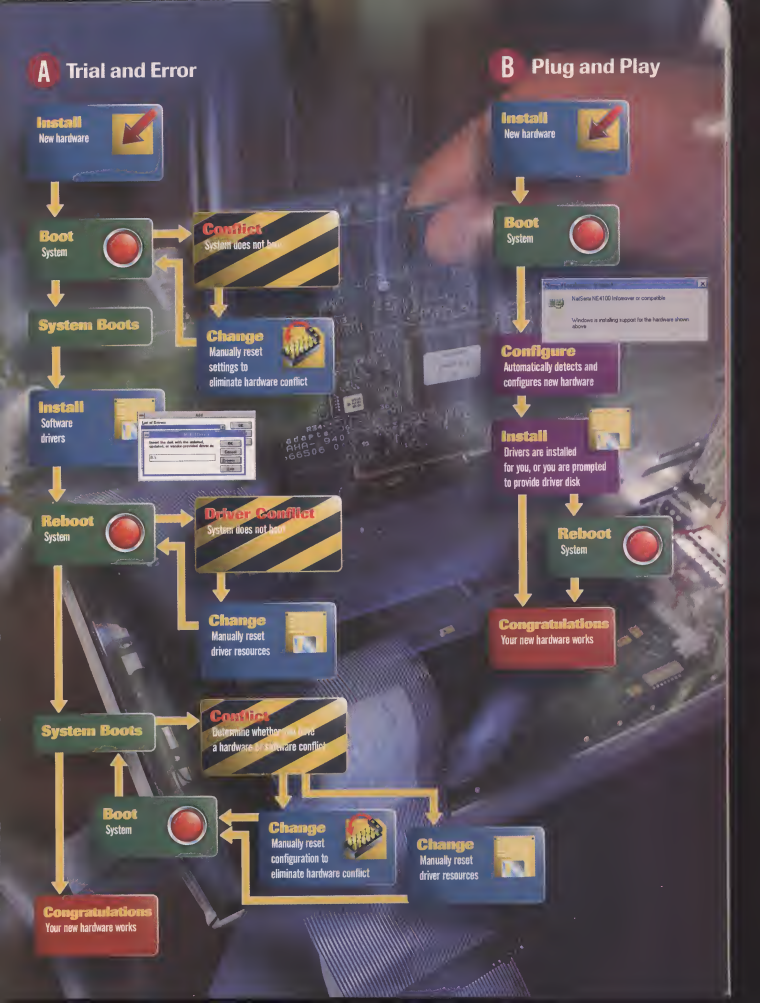
The rules have changed with Windows 95, and you're at the mercy of the operating system and Plug and Play BIOS. If you're finally comfortable installing hardware, get ready to start over with Windows 95.

BY ADAM MEYERSON

A TRIAL AND ERROR: With non–Plug and Play hardware, *you* do all the work. If a DMA setting or an interrupt needs changing, you have to dig through the manuals to find the settings. Once you get the hardware to work, it's your job to install the drivers and make sure they don't conflict with other software.

B PLUG AND PLAY: Windows 95 is designed to automate the upgrade process. *When* Plug and Play works, it installs, detects, and configures new hardware by either the Plug and Play BIOS or Windows 95. However, our tests revealed that Plug and Play doesn't always work.

PHOTOGRAPHS BY ED KASHI / GRAPHIC BY TIMOTHY EDWARD DOWNS

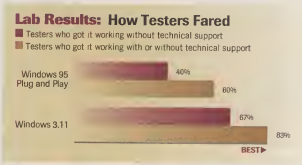

A Trial and Error
Install
New hardware
Boot
System
Conflict
System does not boot
System Boots
Change
Manually reset settings to eliminate hardware conflict
Install
Software drivers
Reboot
System
Driver Conflict
System does not boot
Change
Manually reset driver resources
System Boots
Conflict
Determine whether you have a hardware or software conflict
Boot
System
Change
Manually reset configuration to eliminate hardware conflict
Change
Manually reset driver resources
Congratulations
Your new hardware works
B Plug and Play
Install
New hardware
Boot
System
NetGenie NE4100 Intranetwork or compatible
Windows is installing support for the hardware shown above.
Configure
Automatically detects and configures new hardware
Install
Drivers are installed for you, or you are prompted to provide driver disk
Reboot
System
Congratulations
Your new hardware works

Printers

Pros: Windows 95 automatically detects Plug and Play printers and installs the drivers. The Printers folder helps you manage fonts, paper options, and print jobs.
Cons: New drivers can cause a working system to malfunction, leaving you unable to print.

In every case, Windows 95 detected Hewlett-Packard's LaserJet 4MV printer and automatically installed its own 32-bit driver. After this point, however, frustration set in among the testers. Although it looked as if everything was set up and configured properly, not a single tester could print. A document was spooled to the printer and everything appeared fine, but there was no output.

When we switched to Hewlett-Packard's LaserJet 4P, the situation improved: Using the Remote Debugger for Windows 95, Microsoft's technical support was able to dial in to our system and debug the problem over the phone. The culprit? A bug caused by the combination of the new driver, Hewlett-Packard's new bidirectional features (which let Windows 95 and the printer communicate with each other), and the enhanced parallel port in Compaq's Deskpro 575. A fix, which Compaq will supply, will come in the form of a new driver for the enhanced parallel port.



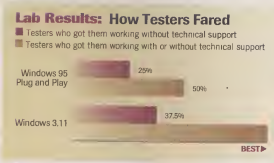
NOTE: RESULTS BASED ON TESTS CONDUCTED IN THE *PC COMPUTING* USABILITY LABS

"Windows 95 surprised me by detecting the printer and installing the drivers as I watched. The only problem was I never got it to print."

OFFICE MANAGER

Video Cards and Monitors

Pros: An integrated utility makes it easy to change video resolution and color depth.
Cons: With the Plug and Play BIOS configuring integrated video and Windows 95 configuring add-in cards, you can be left out of the picture.



NOTE: RESULTS BASED ON TESTS CONDUCTED IN THE *PC COMPUTING* USABILITY LABS.

"Plug and Play didn't work, and attempting to manually set up the video card and monitor was a total disaster."

FREE-LANCE WRITER

We couldn't have orchestrated a better test of the perils of Plug and Play for video cards and monitors if we'd tried. The pitfalls were already there, waiting to trip up our testers. One problem was that Compaq's Pentium systems have built-in video, so when the testers added the video cards, there was a conflict.

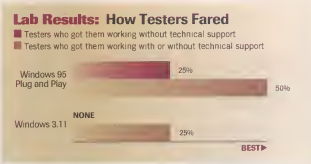
The number of other cards that had already been installed determined the difficulty of the installation. If a tester installed the video card (Diamond's Stealth64 Video 2000) before installing other cards, the Plug and Play BIOS worked much more effectively, automatically disabling the onboard video. Upon booting up, Windows 95 took over and configured the video card. However, the testers who had already installed the sound card or SCSI card experienced great frustration. Windows 95 couldn't resolve the conflicts, even if the onboard video had been disabled by the Plug and Play BIOS. When the new card wasn't automatically enabled, many testers were left with no video at all. As a result, they had to physically remove the video card and start over. Although testers were tripped up by the video cards, they had no problems installing Compaq's QVision 172 monitors.

SCSI and CD-ROM

Pros: SCSI-ID and interrupt conflicts are avoided because Windows 95 automatically configures SCSI controllers. CD-ROM drives work fine.
Cons: If both the SCSI card and motherboard have a floppy controller, the system might not boot and may need to be manually configured.

SCSI cards and CD-ROM drives are among the toughest upgrades. In this case, Plug and Play did help alleviate some of the problems, despite a few false starts. The main culprit? Too many configuration options: You can configure the SCSI controller in its own BIOS, in the Plug and Play BIOS on the computer, or in Windows 95. Testers tried all three, but their best bet was to do nothing and let Windows 95 configure Adaptec's AHA-1542CF SCSI controller automatically. But due to a delay during start-up caused by the BIOS on the SCSI controller, testers frequently concluded that the SCSI controller wasn't functioning properly and tried to change the settings manually.

Because both the SCSI controller and motherboard have an onboard floppy controller, there was a conflict.



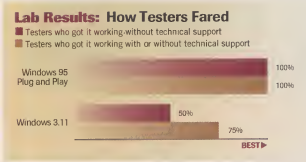
NOTE: RESULTS BASED ON TESTS CONDUCTED IN THE *PC COMPUTING* USABILITY LABS

"Plugging in the card without having to change jumpers was a big plus. It was easier than the old way, but it wasn't exactly plug and play."
SMALL-BUSINESS OWNER

Here Plug and Play offered the best solution. Depending on which peripheral was installed in the system, Windows 95's Plug and Play determined which floppy controller to use and disabled the other one.

Sound Cards

Pros: With Windows 95, you just plug in the sound card and it plays—literally. Windows 95 is packed with utilities that make multimedia easier, such as CD controls and a CD player for audio CDs.
Cons: None.



NOTE: RESULTS BASED ON TESTS CONDUCTED IN THE *PC COMPUTING* USABILITY LABS.

"Installing the sound card was a piece of cake. I had none of the problems I'd anticipated. Plug and Play is great!"
TELECOMMUNICATIONS TRAINER

Installing a sound card can be a highly stressful procedure. You might even say that anyone with a heart condition or a history of mental illness should avoid it all together. So it's not surprising that the testers came into *PC Computing*'s Labs with serious doubts. But Plug and Play eased their stress and changed their minds. Every tester successfully installed the Plug and Play version of Creative Labs' Sound Blaster AWE32 card—without technical support. And testers were able to do it regardless of the peripherals previously installed in the system. In some cases, that meant testers had already added a video card and SCSI controller, yet were still able to get the sound card to work without any help.

When conflicts with other peripherals did occur, most of the testers were able to resolve them through the Windows 95 help system, which steered them to the Device Manager. With this tool, they were able to clear up any problems. When it came to installing a standard Sound Blaster card under Windows 3.11, however, the results were far less encouraging—testers struggled through the entire process and stress levels ran high.

Final Analysis: Early Implementations Show Promise

Does Plug and Play Work?

If it worked as advertised, Plug and Play would revolutionize the PC. Imagine installing new hardware without ever opening a manual or setting a jumper. Windows 95 promises this—and when used with some software-configurable hardware, it makes life easier. But in most cases, it's still far from perfect.

Should I Buy Plug and Play Products? Very soon you won't have a choice, but that isn't necessarily a bad thing. New Plug and Play products will function whether or not you're running Windows 95. Given the choice, you should opt for a Plug and Play version of any product you purchase. It will be easier to install than older versions with jumpers and switches. When it comes to internal boards, don't assume that PCI and Plug and Play are synonymous. In our tests, the Plug and Play products that did the best were ISA versions of Creative Labs' Sound Blaster AWE32 and Adaptec's AHA-1542CF SCSI controller. The old 16-bit ISA bus works great with Plug and Play.

What About Plug and Play Systems? To reap the full benefits of Plug and Play, you'll need a new desktop system with a Plug and Play BIOS. But even on older systems that don't have Plug and Play, Windows 95 detects and configures hardware products. However, Windows 95 won't be able to reconfigure any motherboard devices, and certain conditions might prevent the system from booting. Make sure any new system you purchase is Plug and Play–ready. Because Plug and Play is at an early stage of development, Plug and Play systems that shipped long before Windows 95 was released may need a BIOS upgrade. As long as you have a flash BIOS, it's easy to upgrade—contact your system maker for details.

What's the Verdict on Plug and Play? This is definitely version 1.0. You can expect it to perform well when you're working in a system that has very few peripherals, but prepare for problems as you add more. Learn to use the Device Manager as a troubleshooting tool. It provides you with something you never had when you worked under previous versions of Windows: a central utility that exposes every IRQ, DMA, and I/O address in the system. That alone puts Windows 95's Plug and Play light-years ahead of the conventional trial-and-error method of the last decade.

PC Computing *Usability Labs Team:* LULIT BEZUAYEHU, GEORGE HACKMAN, JR., *and* LYDIA M. KARLOWICZ.

NOTES FROM THE LAB

STRUGGLING WITH **HARDWARE INSTALLATION**

Spend a few hundred hours in *PC Computing*'s Usability Labs, and chances are good you'll learn a few things. That's especially true when you're testing a new operating system and all-new hardware. Plug and Play clearly has enormous potential. But our test results show it won't be an immediate cure-all for your hardware woes. For example, the struggle between Windows 95 and your system's Plug and Play BIOS will continue.

The big contribution of the Plug and Play BIOS is that it can eliminate conflicts that keep the system from booting. It's not uncommon for a new peripheral to cause a conflict and cripple the system. Although most Plug and Play devices power up unconfigured, boot-up devices (such as video cards and disk controllers) don't. If they did, you wouldn't be able to see any video, and you wouldn't have a hard disk from which to boot. These devices are configured as soon as you turn on the power, and therefore can cause conflicts. Unfortunately, these are conflicts Windows 95 can't always prevent.

On the other hand, the BIOS can check for conflicts at start-up and make the necessary changes. The confusion starts when the BIOS selects one setting and Windows 95 decides to change it once the operating system loads.

The test results we highlight in this story are the percentages of testers who successfully installed each product without technical support. Those results are meaningful because the majority of technical-support calls are made during installation. The percentages of testers who installed Creative Labs' and Adaptec's cards without technical support were surprisingly high. That's exciting news, since sound cards and SCSI controllers are traditionally the toughest devices to install.



Is Plug and Play Perfect? Not quite. Our testers often found installing hardware agonizing. The hope is that Plug and Play will soon mean easy, no-stress installation.

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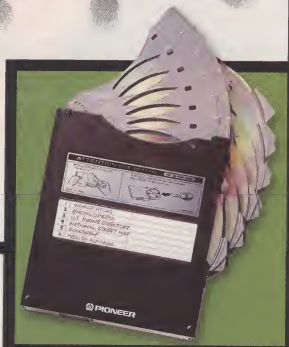
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Ultrafast Digital Modems

If someone told you that you could do everything you do online several times faster—plus a few things you've only dreamed of, like real-time videoconferencing—you wouldn't let a few hundred bucks stand in your way, would you? Of course not. Well, there's finally a new generation of digital modems (more precisely, integrated services digital network, or ISDN, adapters) out there that really work.

And as phone companies make ISDN services cheaper and cheaper, there's no excuse for settling for a vanilla 28.8Kbps analog modem connection.

With an ISDN line, you can make not one call, but two simultaneous calls. It's like having two 64Kbps modems in one. And with the compression some ISDN devices offer, your data could even hit speeds of 500Kbps—18 times the throughput you'll see with the fastest analog modem.

But there's a catch. An ISDN line costs more per month than a regular telephone line. You also need to spend $700 to $1,000 for a digital modem to take advantage of ISDN. Seem like a high price for speed? Maybe, but an ISDN line and adapter can quickly pay for themselves in the time and money they'll save in shorter online sessions and lower long-distance bills.

Should you make the switch? To help you decide, we looked at five ISDN devices: three terminal adapters and two bridge/routers designed for use in a networked environment. Using a dial-up ISDN account provided by the helpful folks at Internex, we ran all five products through their paces on the Internet. Finally, because a digital modem is useless without an ISDN telephone line to connect to, ISDN expert Ann Culver tells you what to expect and what to watch out for when contacting your local phone company for ISDN installation.



PHOTOGRAPHS BY MARK JOHANN

BY MIKE HOGAN

Fast Digital Connections

Executive Summary

Do you work alone or in a workgroup? Individual users will want to check out Zyxel's Elite 2864I-U, which offers the best combination of speed and features, and works over both ISDN and standard phone lines. For Internet or wide-area network (WAN) access in a multiuser environment, we like Ascend Communication's Pipeline 50 for its speed and network management features. If you're cruising the World Wide Web, either product puts you in the fast lane.



Best of Both Worlds: Zyxel's Elite 2864I-U runs at twice the speed of the competition in analog mode and ranks close to the top in digital performance, as well.

Just when you thought modems couldn't get any faster, along come ISDN adapters offering speeds that make 28.8Kbps seem sluggish. While all of these digital modems would benefit from some usability improvements in setup and installation, the speed they offer is unparalleled. Generally speaking, you can have your speed in two flavors: stand-alone and networked. Zyxel's Elite 2864I-U, Motorola Information Systems Group's Hybrid Modem TA 200, and IBM's WaveRunner are digital terminal adapters—or ISDN modems—that feature built-in analog fax-modem capabilities. Ascend's Pipeline 50 and Digi International's DigiBoard DataFire function as bridge/routers and require an Ethernet connection.

Highlights All five devices provide the standard pair of ISDN communications channels, each supporting transmission speeds of either 56Kbps or 64Kbps, depending on your phone company's switching equipment. Some of them can also automatically bond ISDN channels together, when appropriate, to achieve speeds of up to 128Kbps, which is ideal for video transmission. In addition, the Pipeline 50 and WaveRunner support various degrees of compression, for an effective maximum ISDN throughput of 512Kbps—almost 18 times as fast as a 28.8Kbps analog modem.

Our top pick, Zyxel's Elite 2864I-U, supports compression and hits speeds of up to 460.8Kbps. It works with either a bidirectional parallel port or the 16550 universal asynchronous receiver/transmitter (UART) found in newer PCs. Its analog features also go far beyond the Group III fax and 14.4Kbps modem capabilities found in the WaveRunner and Hybrid Modem TA 200. The Elite 2864I-U's 28.8Kbps analog modem gives it an edge over most new computer-telephone integration boards. And like these boards, the Elite 2864I-U has automatic data–fax–voice call-detection and message compression for its voice answering machine. It was also the easiest to install and configure, and is an excellent bridge to a digital world.



All Buttoned Up: Motorola's Hybrid Mobile TA 200 simplifies the user interface with a keypad and LCD readout up front, eliminating the need to pick up the phone to dial.

Lowlights Don't be fooled by the deceptively low $558 price of IBM's WaveRunner. It lacks the necessary integrated NT1 connection that other products provide, and will cost an additional $200 to $300.

When it comes to usability, all of these products leave much to be desired. Although they're OK to operate once they're up and running, you'll age a few years installing them. Some even require you to type arcane commands at the DOS prompt.

We found ISDN setup to be unpredictable and frustrating, with products working at first, then suddenly not working for no apparent reason. At times, when communication snafus occurred, the phone company, Internet service provider, and product vendor would all pin the blame on one another. Sometimes the solutions seemed to be mere flukes. For example, on one occasion we got the WaveRunner to work by removing and reinstalling all of our I/O cards. On another, we just walked away and came back later to find that the WaveRunner was working fine. Go figure.

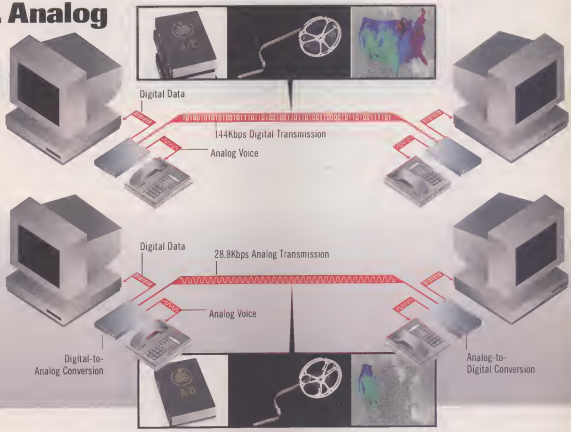
ISDN vs. Analog

ISDN Modems: An ISDN modem transmits voice and data over a digital phone line at speeds as fast as 144Kbps. Here's a sample of what that can get you:

- **Text:** A whole dictionary in 3 minutes.
- **Video:** A 2-hour concert video in 30 minutes.
- **Graphics:** A 100MB U.S. map in 15 minutes.

Analog Modems: An analog modem sends voice and data over conventional, analog phone lines. Compared with a digital modem, a 28.8Kbps modem would deliver the following data in the same amounts of time:

- **Text:** Only A through D from a dictionary.
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- **Graphics:** Only the states west of the Rockies.



Rating **Digital Modems**

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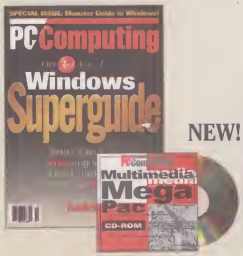
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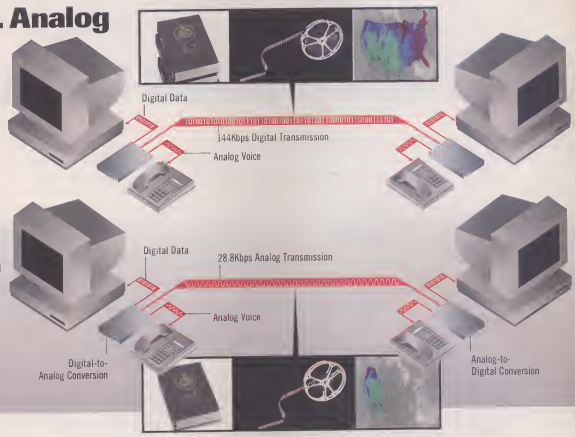
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Rating Digital Modems

How They Measure Up in Our Lab Tests

Product	Price*	Performance	Usability	Technology	Verdict
Elite 2864I-U Zyxel (800) 255-4101 *Reader Service No. 707*	$749 list	★★★★ 460.8Kbps over ISDN; 115.2Kbps over analog.	★★★½ Easiest to install; good diagnostic utilities.	★★★★ ISDN's speed plus rich voice and telephony features.	★★★★ The best of both the analog and digital worlds.
Pipeline 50 Ascend Communications (800) 621-9578 (510) 769-6001 *Reader Service No. 706*	$995	★★★★ 512Kbps over ISDN. No analog.	★★ Setup requires a terminal program.	★★★★ Supports both bonding and compression; remote setup and security.	★★★½ The best interoffice device for multiple users.
Hybrid Modem TA 200 Motorola Information Systems Group (800) 451-2369 (205) 430-8000 *Reader Service No. 708*	$895 list	★★½ 128Kbps over ISDN; 57.6Kbps over analog.	★★★½ The software, detailed manual, and LCD panel ease setup and installation.	★★★ LCD panel lets you monitor the modem's status; supports only a single line.	★★★ Basic external adapter; good fax and installation software.
WaveRu ner IBM (800) 426-4968 *Reader Service No. 709*	$558	★★★½ 512Kbps over ISDN; 57.6Kbps over analog.	★★½ Detailed manual, good software, but overly complex installation.	★★ Lacks necessary NT1 connection and needs setup software upgrade.	★★½ You get what you pay for. You should consider spending more.
DigiBoard DataFire Digi International (800) 344-4273 (612) 943-9020 *Reader Service No. 710*	$595 list	★★ 128Kbps over ISDN; no analog.	★★ You'll need to memorize "AT"-type setup commands.	★★½ Has the basics, plus software designed to reduce line charges.	★★ A needlessly complex route to ISDN connectivity.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE

Getting **Wired** for ISDN

It may look like just another phone line to you, but an ISDN line can be much more painful to install. While the experience varies greatly from region to region, some people have likened it to getting a root canal. Why does it hurt so much? The truth is, many regional phone-company employees still don't know enough about ISDN to help you.

Imagine this: You call your telephone company to order an ISDN line. The field engineer who comes out to install the line has no way to test the line he or she installs. Eventually, in order to provide the service you requested, a field engineer must return to your site to take out the first line and install a new one that is run out of a different phone-company office. A month after placing your order you finally have ISDN installed. It's an all-too-familiar scenario for ISDN customers.

Preparation Pays Despite the obstacles, knowing what to expect before you start can save time and headaches. First, you need to check availability. This is determined by the type of switch located at the central office that services your local calling area. (If you are serviced by an independent phone company, your chances of getting ISDN this century are slim.) If you want to use the ISDN line for data and voice communications, you must specify this. And if ISDN is available, you may be assigned a new phone number.

If the phone company offers ISDN on a "foreign exchange" basis—from an office outside your local exchange—then a phone number change may also be required. Also verify that you're not on an ISDN "island," which means you'd be unable to connect outside your area. And be aware that, unlike your current phone line, ISDN is an electrically powered service. If the power goes out, your ISDN line will too. Find out if your service provider offers backup power in case of an outage.

Assuming you are able to order a line, be prepared to tell the phone company what type of ISDN modem you're using, your long distance carrier, and what type of data and applications you expect to use.

Ask Questions You'll need some information in order to set up your ISDN modem once the line is in, too. The phone company should tell you the switch type and manufacturer, signaling protocol, ISDN phone numbers, Service Profile Identifier numbers, and service-order and verification numbers (identifying your long distance carrier). Keep this information handy during installation—you'll need it to set up the modem properly. If the phone company has to do any additional wiring, it will cost more. Expect to wait two to four weeks for installation.

When it comes time to install the line, make sure the engineer tests the line before leaving. If you are using the line for data communications, make sure this is tested separately. It may take a few visits before you are actually up and running. Once the line is installed, you can configure your ISDN modem using your telephone. Be sure you have all of the information described in the paragraph above, however; without it setup can be a nightmare.

Despite the headaches, once your ISDN line is working, you will love it. ISDN lines rarely go down, and they provide lightning-fast video and data transmission. And as tedious as the set-up process may seem now, it is getting better. **ANN CULVER**

Service Providers

Phone Company	Service Area	Installation/ Monthly Fee	What to Watch For
Ameritech (800) 832-6328 *Reader Service No. 711*	IL, IN, MI, OH, WI	$150 to $200/ $30 (depends on state)	Some ISDN islands don't interconnect.
Bell Atlantic (800) 570-4736 *Reader Service No. 712*	DC, DE, MD, NJ, PA, VA, WV	$100 to $140/ $37	Phone numbers may need to be changed.
BellSouth (800) 428-4736 *Reader Service No. 713*	AL, FL, GA, KY, LA, MS, NC, SC, TN	$200/starting at $65	May lack non-Bell connections.
Pacific Telesis (800) 472-4736 *Reader Service No. 714*	CA, NV	CA: $71/$25 NV: $230/$80	Little D-channel connectivity.
Nynex (800) 438-4736 *Reader Service No. 715*	MA, ME, NH, NY, RI, VT	$115/$45	Coverage isn't extensive, but it's improving.
Southwestern Bell (800) 792-4736 *Reader Service No. 716*	AR, KS, MO, OK, TX	$500 to $600/ $46 to $93	Little coverage in AR, KS, MO.
GTE (800) 448-3795 *Reader Service No. 717*	Hawaii and other U.S. regions	$115/$35 (depends on area)	Coverage spotty; limited testing ability.
US West (800) 728-4929 *Reader Service No. 718*	AZ, CO, IA, ID, MN, MT, NE, ND, NM, OR, SD, UT, WA, WY	$67 to $110/ $55 to $70 (depends on state)	Very little coverage in ID, IA, MT, NM, ND, UT, WY.

NOTE: ISDN IS NOT CURRENTLY AVAILABLE IN CONNECTICUT OR ALASKA.





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If you dig all that technical stuff, great. But if it looks more like Martian code to you, call IBM PC Direct. And we'll be happy to translate it into clear, plain English.

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Final Analysis: The Pain of Installation Is Well Worth the Gain in Speed

It's Time to Go Digital

Getting ISDN isn't a walk in the park. It's an obstacle course. But the biggest rewards in productivity are always discovered along personal computing's bumpiest edge, so if you tough it out, you'll come out ahead.

Most of the issues that tripped us up were circumstantial—phone companies and adapter vendors not reading from the same page, mix-ups with new protocols, that sort of thing. Your experience will undoubtedly be different, depending on your phone company's switching equipment and personnel, and how well your ISDN adapter coexists with other devices in your PC—as well as those at the other end of the line.

You might encounter incomplete documentation or arcane installation routines, but by the time you read this, there should be better handshaking among products and services as well as some scheduled improvements in installation routines. We would also like to see better diagnostic utilities, however, such as those that come bundled with Zyxel's Elite 2864I-U.

For remote ISDN dial-ups into the office LAN, real-time resource sharing by multiple users, or even hefty graphics downloads from the Internet, Ascend's Pipeline 50 offers the best solution. It has the widest bandwidth plus extensive remote management, and security features for wide-area network administration.

Zyxel's Elite 2684I-U, on the other hand, lets you send faxes from your computer and gives you access into non-ISDN Internet providers or online services such as CompuServe. These options are important, because even if you get an ISDN line, it will take the rest of the world a while to catch up.

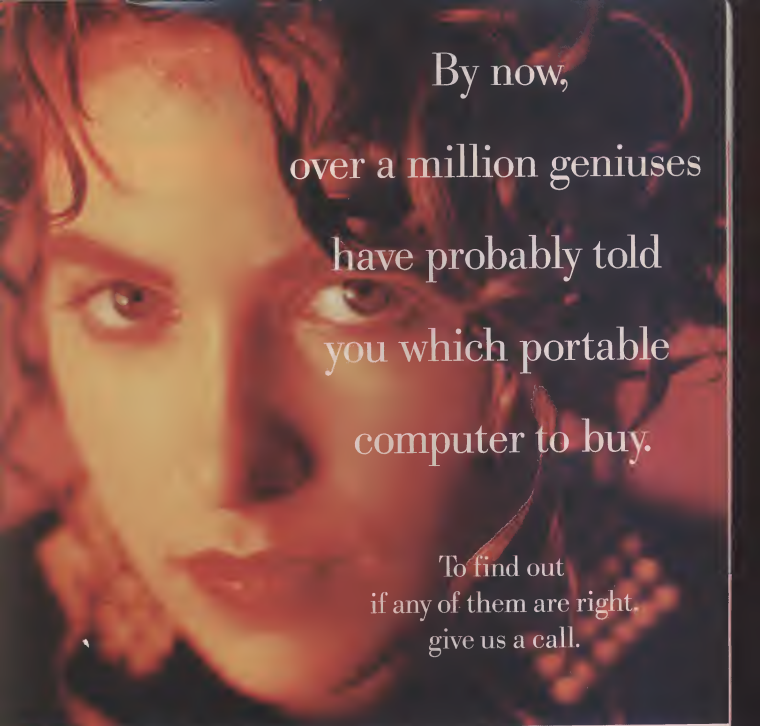
Whichever product you choose, be sure to call before you buy to see if your phone company's switch is compatible with the ISDN adapter you're considering. Bumps and bruises aside, the incredible bandwidth these products offer is well worth the trouble. Once you're connected, you'll sail through cyberspace so fast you'll feel the wind in your hair.

MIKE HOGAN *is a frequent contributor to* PC Computing. *He is based in Woodland Hills, California. Lab testing performed by* IBRAHIM GUL.

DECISION MAKER

CHOOSE THE RIGHT **DIGITAL MODEM** FOR YOUR BUSINESS

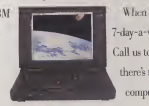






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Crossroads: Which

EIDE: Faster Than Ever

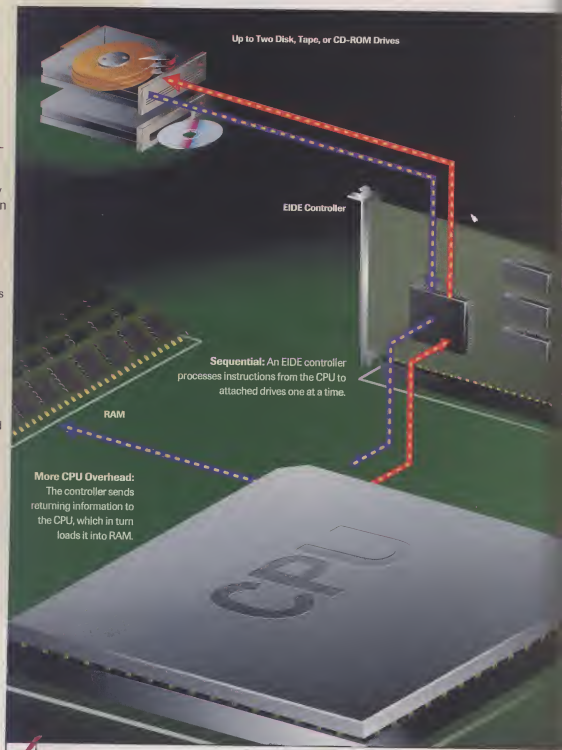
Enhanced IDE (EIDE) transfers data at speeds of up to 13.3MBps on drives as large as 8.4GB—speeds and capacities that were once SCSI's exclusive preserve. Many new PCs have two built-in EIDE controllers, each of which handles two internal storage drives.

Pros
- Built into most new systems
- No configuration headaches
- No additional drivers required for hard drives

Cons
- Limited to two devices per controller
- Limited to internal disk drives, CD-ROM drives, and tape drives (no scanners)
- Drives are accessed one at a time, not simultaneously

Timetable
Although it's sure to be included with most desktop systems over the next year, EIDE isn't likely to overtake SCSI's stronghold in the network-server or multiple-peripheral desktop market.

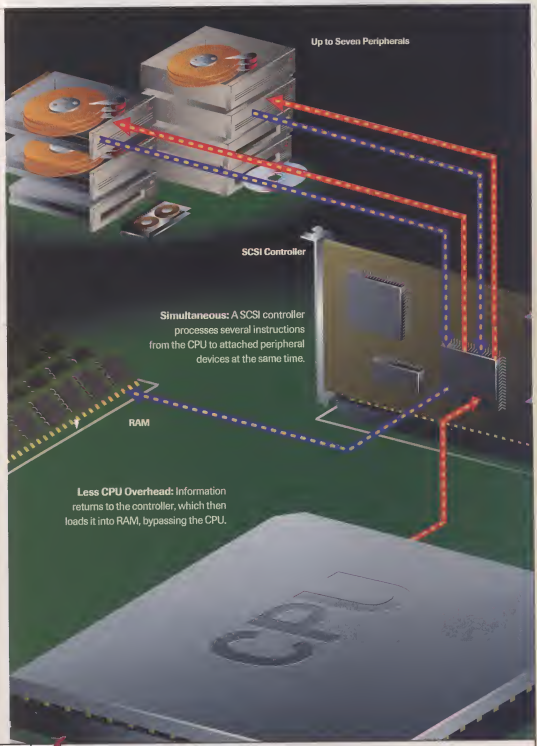
Opinion
"EIDE is likely to be standard issue on most single-user PCs sold in the future. SCSI isn't dead by any measure, though."
MIKE HOGAN
INDUSTRY ANALYST



✓ **EIDE:** Affordable, and a good solution for most desktop needs.

Multidevice Interface?

BY MATTHEW LAKE • ILLUSTRATION BY TIMOTHY EDWARD DOWNS



✓ **SCSI:** High speed, low CPU overhead make it best for servers.

SCSI: Seven At Once

The small computer system interface (SCSI) lets you add up to seven devices—including hard drives, scanners, and CD-ROM drives—to a single interface. SCSI is widely used in network servers and high-performance desktop PCs because of its ability to handle multiple devices simultaneously.

Pros

- Seven devices per adapter
- SCSI currently offers transfer rates of 40MBps, vs. EIDE's 13.3MBps
- Devices can be external

Cons

- More expensive than EIDE, which is included in most systems
- Configuration can be difficult
- SCSI adapters often require additional device drivers

Timetable

SCSI will continue to maintain its strong presence in the server market for several years to come.

Opinion

"The advantage of SCSI devices is that they aren't passive—they communicate as peers, sending commands and data in packets addressed to each other."

ROBERT L. HUMMEL
CONTRIBUTING EDITOR

Help: Working Smarter

Banish the World Wide Waste of Time

Some say that the World Wide Web is a cultural revolution like the introduction of television in the 1950s. And it's true. However, the Web is more like 2 million television channels with a clicker that needs a minute to change channels. And just like television, some sites are entertaining, others sleep-inducing. For all you know, there may be some pretty terrific sites out on the Web, but you've only visited a million URLs so far, and you haven't found anything to e-mail home about yet.

Inevitably, there's been a backlash against the Web, and users everywhere are now calling it a world wide waste of time. It's big, it's amorphous, and only one site in 400 or 500 is worth a second glance. And if you don't know where you're going or how to get there, you'll waste plenty of your precious time. But it doesn't have to be that way. All you really need is a clear idea of what you want, and even if you don't know how to get there, you'll eventually find your way.

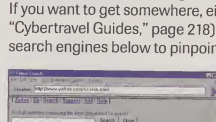
Quo Vadis? On the info autobahn, just like your run-of-the-mill freeways and country roads, you don't get anywhere fast if you don't know where you're going and the shortest way to get there. First stop, shelfware (that's books and magazines to you). You wouldn't take a trip to a foreign country without a travel book, right? The Web is beyond foreign travel. It's more like space travel, and you need the right literature before you attempt it. There are seemingly more Web books than there are Web sites. Check out "Cybertravel Guides," page 218, for a list of recommended books.

But since new Internet sites are cropping up at a staggering rate—and old ones are disappearing fast, too—there's no substitute for keeping up with up-to-date listings such as those printed in magazines or posted in critical sites online. The key word here is *critical*. Everyone with a Web site puts up links, but the sites to watch are those that are updated regularly with true reviews, rather than say-nothing "Cool Site of the Day" labels. ("Cybertravel Guides" also includes a list of well-connected sites.)

Search High and Low So what if you can't find what you're looking for in your favorite book or navigational site—or you don't have time to browse? That's where Web search engines come into their own. Yahoo is a comfortable place to use as your home base, although its search engine does lack some of the niceties and robustness of a "true" Web search engine—its search is conducted only on the contents of its own site (which, while very thorough, isn't a match for the whole Web). If it's only a local search, why bother? Because if you can't find what you're after there, you scroll to the bottom of the Yahoo page and you have one-click access to some very robust options—Lycos, WebCrawler, EINet Galaxy, Aliweb, and the CUSI Search Engines.

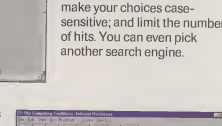
SNAPSHOT SURF-FREE WAYS TO GET THERE

Strides: Wandering through the Web is for clueless newbies. If you want to get somewhere, either use a guided tour (see "Cybertravel Guides," page 218) or one of the guided-missile search engines below to pinpoint what you need.



Gateway to the Web: Yahoo's internal search engine points you in the right direction. To do it right, restrict your search to titles, URLs, or comments; make your choices case-sensitive; and limit the number of hits. You can even pick another search engine.

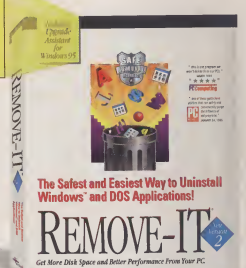
Opinionated Tour Guide: It's not a get-there-quick option, but you can often find exactly the information you need by browsing through a structured list of sites—such as Ziff-Davis' Computing Traillblazer home page. It includes reviews, recommendations, and details to cut down on the number of time-lagging jumps to dud sites.



The Smart Way To Move to Windows® 95.

Includes Upgrade Assistant™ for Windows 95

Special Windows 95 Promotional Price!
Now for a limited time at participating resellers.



Attention Norton Desktop® for Windows, PC Tools® for Windows, and Dashboard® users!
Remove-IT's Upgrade Assistant is the only way to automatically configure your Windows 3.1 applications into Windows 95.

95 Remove-It 2 is already the safest and easiest way to clean unneeded applications and files from your PC. But it doesn't stop there. Remove-IT 2 also includes an exclusive Upgrade Assistant that ensures a near effortless move to Windows 95. The Upgrade Assistant is a personal guide that leads you step-by-step through the process of preparing your system for Windows 95. Here's how easy upgrading can be.

Pre-Installation Cleanup – The Upgrade Assistant reduces the chance of upgrade problems by carefully clearing valuable disk space to make room for Windows 95.

Windows 95 Configuration – If you decide to run both Windows 95 and Windows 3.1 until you're comfortable with the upgrade, the Upgrade Assistant will automatically configure your Windows 3.1 applications into Windows 95. Or if you use Norton Desktop, PC Tools, or Dashboard and install Windows 95 over Windows 3.1, the Upgrade Assistant will automatically transfer your Windows 3.1 program groups into Windows 95. Either way Remove-IT saves you the hassle of manually reinstalling every single application, or recreating all your program groups!

Post-Installation Cleanup – When you're ready to leave Windows 3.1 behind, the Upgrade Assistant will simply wash it away. All the unneeded remains of previous Windows installations are removed so that your PC runs at peak efficiency.

And the price for Remove-IT 2 with your "personal" Upgrade Assistant for Windows 95 is only **$44.95**. So, get smart! Ask for Remove-IT at your favorite retailer, or call our handy toll-free number: **1-800-380-2607. Ask for extension 1208.**

"...this is one program we won't delete from our PCs..." "★★★★★" PCComputing March 1995

"...one of those gotta have utilities that can safely and conveniently purge the leftovers of old programs." PC Magazine January 24, 1995

"...comprehensive, intelligently designed and effective." "...helps prevent you from deleting necessary files." Windows February 1995

"One of Remove-IT's biggest advantages is its user interface." PC World January 1995

Vertisoft superior software solutions

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Circle 324 on reader service card.

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We recommend branching out to the WebCrawler home page first (http://webcrawler.cs.washington.edu/WebCrawler/WebQuery.html). It's not as all-inclusive or easy to use as some of the other options—especially Lycos—but it's a great tool to get the job done quickly.

If that doesn't do the trick, call in the slow-but-thorough heavy-hitter, Carnegie Mellon's Lycos (http://lycos.cs.cmu.edu). Lycos's searches are the most thorough of all—right down to the word level through almost 3 million Web documents. That includes Web, FTP, and Gopher sites. Even if the service were undersubscribed, Lycos' slow, nonstandard search engine would be sluggish. But Lycos is very busy. And that means that if you're searching at peak times (for example, any time around the clock), you'll have to be prepared to resubmit your search, perhaps several times. So Lycos is the best Web information seeker—which only means it's harder to get its attention.

Boolean Who? If you want a search engine you can question in plain English, rather than using Boolean expressions, look no further than InfoSeek (http://www.infoseek.com:80/Home). This is a fee-based service ($9.95 per month, including 100 transactions, is the most cost-effective membership plan) with a limited-time free preview option—one month or 100 transactions, whichever comes first. Its big boast: Full-text searching using natural-language techniques. Ask it "Why is the sky blue?" and you'll get a series of possible answers in the way of links to relevant Web sites. However, you can use shorthand and get the same response, as the search engine just looks for keywords and invents its own Boolean string that's invisible to the user. You'll get the same results from entering "sky blue" and it will take less time to enter. Either way, you'll also get things you aren't looking for: The first hit on this search was the Blue Sky Software home page.

Beyond HTML Pages If you're after sundry other free stuff, you can travel hit or miss through Web sites—but even searching purposefully won't get you too far because the sad truth is, most Web pages just offer links to other Web pages and FTP sites. It's always best to go straight to the source: A dedicated gopher or FTP search engine. The classic tool is Archie—not the easiest Internet program to use (in fact, unless you can *grep*, it's not remotely easy). But it's powerful. So what you need is good solid advice on how to use it. And the advice doesn't get better or more solid than Suranet's Archie Guide (http://www.sura.net/archie/Archie-Usage.html). This is a very handy resource kit—it's clearly written and precise. But Archie's still a tough tool to master.

What better adjunct to Archie than Veronica? You'll get a netful of comic book characters in Gopher searching. Veronica (Gopher://veronica.scs.unr.edu:70/11/veronica) is a client-server database system that tracks information throughout the world's Gopher sites—which makes Veronica servers both valuable and horribly busy. The new Veronica front ends look first for servers that aren't too busy. But don't expect to get fast results.

If the other two comic book characters are too busy to be of any help, try out the third, Jughead (gopher://gopher.utah.edu/11/Search%20menu%20titles%20using%20jughead). For Gopher sites only, Jughead

EXPERT TIPS TIME-SAVING TRICKS

Money Pit: Online browsing is habit-forming, and it's an expensive habit at that. Follow our tips for saving money in cyberspace.

1. **Dispense with dialog boxes.** Want to download a file without viewing or playing it right away? Press Shift and click on the link. This will bypass the stage in which the browser looks for a viewer and pops up a dialog box asking if you want to download. Instead, you'll cut straight to the File, Save As dialog box.
2. **Store pages on your hard disk.** Found a page online with a group of links that you really like, but you don't want to keep logging on to a slow site? Keep the page on your hard disk. If you use Netscape Navigator 1.1 or later, get to the site; select File, Save As (or press Ctrl-S); and name the file. This gives you a transportable, 6K-or-thereabouts file in HTML format to use as your home page file. If you use Mosaic, select File, Document Source, and click on the File, Save As button. Save it as a file with an HTM extension, then use File, Open Local File to open it.
3. **Move your home page.** Perhaps that home page you've been using doesn't look so hot anymore. If you've found a site you prefer, change your home page easily—even if it's on your hard disk. Under Navigator, select Options, Preferences, Styles. For a site, enter http://www.zdnet.com (or whatever). For a file on your local drive, enter file:///zdnet.htm. Under Mosaic, select Options, Configuration, Home Page.
4. **Configure a viewer or player.** Again, select Options, Preferences, Helper applications. Click on the Mime type (such as AUDIO/X-AIFF) and click on the Browse button next to the Launch Application window. Look for a quick-loading application that can open files of that extension (such as WPLANY.EXE).
5. **Remember: Graphics are a luxury.** Most sites offer a text-only option. On dial-in connections, make sure all your URLs point to the text-only site (for example, instead of http://www.zdnet.com, use http://www.zdnet.com/Welcome_noimap.html).
6. **Keep searches simple.** Most search sites provide three basic Boolean options: AND, OR, and NOT. Don't get bogged down in overly specific queries, though. Keep them as general as possible at the outset, because they take less time that way, and they're more likely to include what you're looking for.
7. **Leave your mark.** Bookmarks are the most important time-saving tools in your possession. Get used to adding sites to your list of favorite places or bookmarks (whatever your web browsing software calls it), and use this list as your primary navigational tool. But do go back and remove sites you don't frequent anymore from that list before it gets too long, and therefore, inefficient.

May we suggest some advance preparation for Windows® 95?



Fig. №1 "H"

Fig. №2 "E"

Fig. №3 "L"

Fig. №4 "P"

Or, feel free to call us later.

Seems a lot of us are discovering that our hard drives simply aren't prepared to make the leap to a new operating system. Not enough room. Too much garbage clogging the drive. Or, as we have seen firsthand on several occasions, both.

At last, there's a simple utility which can clean things up and get your system ready. Chances are good that the memory is there, it's just busy storing all those games, last year's tax preparation program, a recipe from Aunt Gladys and several files you brought home from work but never needed.

UnInstaller™3 is the newest version of 1994's No. 1 selling Windows application.



Not only will you organize your system and save megabytes of disk space, you'll also be able to move, archive and transport applications. This lets you take advantage of a second drive, save space by storing compressed files, and transport applications and data to another PC.

In the long run, a better organized hard drive means better Windows performance and less chance for disaster.

We like to think of it as finding the help you need before you *really* need it. Signal us anytime at 1-800-775-8645.

MicroHelp

Remember, it's a jungle in there.™

© 1995 MicroHelp, Inc. Windows is a registered trademark of Microsoft

Circle 102 on reader service card.

gives you the big three Boolean operators—AND, OR, and NOT—to attack your searches, which is a boon for the database-trained. Oh, but it falls in with the common refrain: It's oversubscribed, therefore it's slow.

Newsgroups Because Web sites lag dreadfully behind paid services like CompuServe in forum threads, most of the action seems to take place in Usenet newsgroups, which are widely available and accessible through CompuServe, America Online, and Microsoft Network. Of course, there are so many thousands of them that it could be a big sinkhole of your time trying to find the one you want. If you belong to a paid service with links to the Internet, you can get a good list of moderated newsgroups. (On CompuServe, GO USENET; on America Online, keyword NEWSGROUPS; and on Prodigy, Jump NEWSGROUPS).

But for a wider selection, you have to search farther afield. Stephanie da Silva's public mailing lists (http://www.neosoft.com/internet/paml/) is a hypertext Web collection worth a look-see. To receive a more exhaustive series via e-mail, which can be searched offline using your own tools, send e-mail to an automatic mailer at MIT—mail-server@rtfm.mit.edu—and include these two lines in the body of your message:

```
send usenet/news/answers/active-
newsgroups/part1
send usenet/news/answers/active-
newsgroups/part2
```

Go to School More comfortable picking up Net niceties with a structured series of lessons, but can't find the right teacher? Try a correspondence course via e-mail. Patrick Douglas Crispen of the University of Alabama conducts such sessions. All told, more than 60,000 subscribers have participated in his lessons, and you can get old sessions delivered to you once a week by sending just a couple of e-mail messages.

First, send a message to listserv@ualvm.ua.edu with the line

```
get week 1 package f=mail
```

In a few days, you'll receive a couple of e-mail letters about the workshop and how you can retrieve old lessons free of charge. Retrieving lessons is easy enough: Send another e-mail to the list server with various "get" commands.

Go Low-tech Remember books? You know, where the word "page" originally came from? Whenever you look for answers, first ask yourself whether the Web or the Net in general are the only research tools at your disposal. True, you have access to thousands, if not millions of documents when you're on the Net, but some of that research time is counterproductive, because you're likely to run into seductive surprises along the way and forget what you set out to achieve. The road from *GOP* to *George Bush* to *Kate Bush* is but a few mouse clicks away, and—hey, check this out: Kate's directed a movie based on . . . oh, sorry, where was I?

So look around the office—the answer to your research may be in one of your no-frills paper-based or CD-ROM dictionaries or almanacs. Unless you just *have* to read the latest word on your favorite vocalist, that is. **MATTHEW LAKE**

Matthew Lake is coauthor of the book Windows 95: Making It Work for You, *ZD Press, 1995.*

FYI CYBERTRAVEL **GUIDES**

The following are a few of our favorite books, sites, and search engines to get you started on the Net and the Web:

Books

Though sites on the Net and the Web change daily, some books come in very handy when you're looking for specific topics.

- Ed Krol's *The Whole Internet User's Guide and Catalog* (O'Reilly & Associates, 1994)
- Patrick Vincent's *Free Stuff from the Internet* (Coriolis Group, 1994).

Navigational Sites and Search Engines

To minimize the hit-or-miss aspect of Web surfing, the following sites give you advice before directing you to other home pages:

- **Global Network Navigator (GNN):** An extremely well-laid-out, magazinelike page that gets many hits, and is hence a bit slow to search. http://gnn.com/gnn/gnn.html
- **Yahoo:** Out of Stanford University, Yahoo divvies up the Web into broad subject areas that are best searched rather than browsed—but it's speedy for such a busy site, and it's comprehensive. http://www.yahoo.com/
- **Ziff-Davis' Computing Trailblazer:** A compendium of computer-oriented sites reviewed in Ziff-Davis magazines, including *PC Computing*. http://www.zdnet.com/~zdi/tblazer
- **Carnegie Mellon's Lycos:** http://lycos.cs.cmu.edu
- **WebCrawler Home Page:** http://webcrawler.cs.washington.edu/WebCrawler/WebQuery.html
- **InfoSeek:** (fee-based) http://www.infoseek.com:80/Home

FTP/Gopher Search Engines

With the explosion of the World Wide Web, it's easy to forget the original Internet stars. Here they are:

- **Archie Guide, Suranet:** http://www.sura.net/archie/Archie-Usage.html
- **Veronica:** Gopher://veronica.scs.unr.edu:70/11/veronica
- **Jughead:** gopher://gopher.utah.edu/11/Search%20menu%20titles%20using%20jughead

PAPERLESS READING

Internet Books Online
Download Brendan Kehoe's book *Zen and the Art of the Internet* (ZEN.EXE) and Patrick Vincent's *Free Stuff from the Internet* (FREBIE.ZIP) from PC Contact's data library 8 (Misc.). See page 532 for downloading information.

IT'S NOT IF. IT'S WHEN.

Introducing the new shape of advanced surge protection: SurgeArrest® by APC

The simple truth may be disturbing: most PC's already have more surge protection built into them than that provided by most so-called "surge protectors." In other words, *buying no protection at all* is as good as under spending on one of the most important PC decisions you can make. Worse yet, the only way you'll find out your "protection" is (or was) inadequate is the hard way: the school of high shocks.

DON'T PLUG AND PRAY

While some things can be trusted to faith alone, proper power protection isn't one of them. Not surprisingly APC's SurgeArrest has become one of the fastest-growing lines of power protection in the world by doing what it says: stopping surges from damaging your sensitive electronics, today, tomorrow. Forever. With a lifetime warranty, SurgeArrest will be the last surge protector you ever have to buy.



APC's SurgeArrest provides the best performance because it packs the most protection inside it's shell (guaranteed up to $25,000). Since SurgeArrest carries a lifetime warranty, it will be the last surge suppressor you'll ever have to buy.*

* See policy details

PERFORMANCE FIRST, SAFETY SECOND

SurgeArrest is so advanced, its SafeShield design holds its own patent (#342,055). The smooth curves isolates your equipment from power problems, then pick them off one by one (see below). This multistage protection is far superior than single technology "surge suppressors." Moreover, a SurgeArrest is available for any application, including phone lines and cable TV, and performance is even backed by up to a $25,000 repair/replacement guarantee on any properly protected equipment. Unlike competitive policies packed with fine print which disclaims their warranty for lightning strikes (just when you need it most!), SurgeArrest even provides protection against direct lightning strikes, so you can rest easy even in the worst storm.





Lab tests prove SurgeArrest's superiority, which eliminates a 6000 Volt surge (top) while Brand T lets through high levels to equipment (bottom).

But SurgeArrest goes beyond the performance you want to the safety you need. SurgeArrest's SafeShield design incorporates a fail-safe thermal fuse to reduce the danger of surge-induced fires, a site-wiring fault indicator to automatically diagnose dangerous wiring conditions, and Catastrophic Event Protection, to ensure that your delicate equipment is protected at all costs, even by sacrificing the unit. And since a "Protection Working" indicator is standard, you never have to wonder if SurgeArrest is prepared to take a hit. If the indicator goes out, simply call APC for a new SurgeArrest at no cost to you.

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APC has won more awards for performance and reliability than all other power protection vendors combined. Not surprisingly, when PCWorld recently went shopping for the ideal surge suppressor for the home office, they came up with SurgeArrest. So protect yourself before you kick yourself. Ask for APC SurgeArrest with the SafeShield design wherever quality computer products are sold.

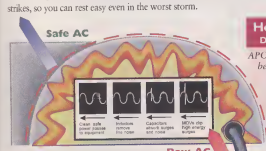
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"We used to believe all surge protectors were alike... but when a storm hit every surge protector we own was blown except for SurgeArrest. It's that much better of a product..."
Roxie (left) and Sheila Russell

"SurgeArrest's indicators diagnosed a wiring fault in a building we just moved to. The landlord fixed the problem, but if we had used a cheap unit instead of SurgeArrest we would have had to pay. SurgeArrest has saved us time, money, and equipment problems..."
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HOW APC'S PATENTED SAFESHIELD DESIGN PROTECTS YOUR EQUIPMENT

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* EPA Energy Star, MPR II and DPMS.

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Circle 107 on reader service card.

Getting the Most from Windows 95

USING WINDOWS 95

EASY HARDWARE: *What the jargon means and why it matters.* **224**

SETTLING IN: *How to personalize your desktop.* **239**

WORK HABITS: *Make Windows work the way you do.* **260**

WHAT'S NEW IN 95: *How (and why) you should upgrade.* **284**

WINDOWS RESOURCE KIT

COMMUNICATIONS: *From e-mail to ISDN, here's how to connect.* **322**

TROUBLESHOOTING: *Find and fix any problems ASAP.* **434**

"Hey! *You* know something about computers. Maybe you could help me with this problem. . . . " Heard that before? You'll be hearing it a lot more, as your coworkers realize they need some help to move to Windows 95. You have two choices: Become an unpaid tech-support specialist, or show them Ed Bott's *Using Windows 95* (Que, 1995). These chapters (like the rest of the book) patiently explain the concepts that novices stumble over the most. And to keep your technical edge, here are some pointers from Microsoft's *Windows 95 Resource Kit.*


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Windows Hardware 101

You don't need to know what's under your car's hood to drive it, at least most of the time. But when it's 12 degrees below zero and the old clunker won't start, you could be on the road a lot faster if you had a basic understanding of what a spark plug does. Same with your computer: If it suddenly stops working, it helps to know which piece you need to bring in for repairs.

And if your PC just seems too slow, it might be because one of the pieces of the hardware team isn't pulling its weight. The PC on your desktop is probably good enough to do everyday work with Windows 95. But that doesn't mean you're stuck with it. You can make it faster, add extra storage space, or plug in a bigger monitor so you can see more. Thanks to a Windows 95 feature called Plug and Play, it's easier than ever to add new hardware to your system.

What's Inside Your PC?

You don't need to know every little detail about your PC, like who made the floppy disk drive. You don't need to know who made your car's spark plugs, either—as long as it has a full set. But you should know whether your car has an automatic or manual transmission. And if you know some basic facts about your PC, you'll have a much easier time when you need to talk with other people about your hardware. Here are some fast facts about common types of hardware:

CPU The *central processing unit* is found on a teensy silicon chip inside your computer. Today's most popular chips are the *Pentium* and the *486;* you can run Windows 95 on an old *386,* too, but not on a *286* or *8088.* The CPU is your PC's brain—the boss that tells all the other pieces what to do every time you press a key or move the mouse. If your CPU is too slow, you get to see the Windows 95 hourglass all the time.

RAM Random access memory (pronounced like the sheep) is a short-term storage area for data. Anything that's stored here will vanish—*poof!*—as soon as you turn the power off, unless you save it to a hard or floppy disk. Windows carves out a chunk of RAM for everything you do—no matter how big or small. Try to do too much at once and Windows will tell you it's time to add more RAM or close some windows.

Hard Disk This is the long-term storage where your computer remembers things even after you turn the power off. All your files, folders, and programs are stored here, the same way TV programs are stored on videotape. When you double-click on an icon, Windows has to find the icon's data on your hard drive, then copy it into RAM so you can work with it. Even the fastest hard disk is slow compared with the rest of your PC.

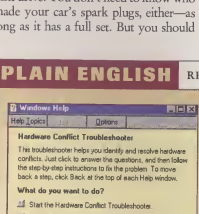
Monitor Also called *display*, *screen*, or *CRT* (for cathode-ray tube), this is the part of your PC that looks like a television screen. Under a powerful magnifying glass, you can see that the picture is actually made up of thousands of tiny red, green, and blue dots, called *pixels.* This is the place where you see your work. A bigger monitor lets you see more at once; a higher-resolution monitor is easier on your eyes.

Video Adapter This hardware actually puts the things you see on screen. If you have twenty-twenty vision and the right monitor, you can use some video cards to shrink windows and icons so you see even more things at once. Hey, drawing all those boxes and buttons is hard work. Plain-old *video cards* are called *VGA;* fancy video cards are *Super VGA.* Really expensive video cards get slick brand names.

Windows 95 Knows What Kind of Hardware You Have—Well, Usually

When you start your PC, the first thing Windows does is look at all the hardware in your system. If there's any housekeeping that needs to be done, this is when it happens. Windows is responsible for making sure that all the parts of your PC get along peacefully—you

PLAIN ENGLISH RESOLVING CONFLICTS



A resource conflict happens when more than one piece of equipment is trying to use a port or other piece of hardware. Windows 95 has built-in help for this problem in the form of the Hardware Conflict Troubleshooter. To start up this wizard, click on the Start button, and choose Help from the menu. On the Contents tab, double-click on Troubleshooting, then click on the entry labeled If You Have a Hardware Conflict. Click on the appropriate button to get the process started, and then follow the detailed instructions.

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don't want the phone to start dialing when you click on the Print icon.

What happens when you add a new piece of hardware—like a CD-ROM drive, or a sound card, or a new printer or modem? The first time you start Windows after plugging in the new hardware, it should notice that there's a new device and automatically set it up so that it works with all the software and hardware you already have.

Most of the time, Plug and Play makes sure your PC just works. But there are two situations in which you'll need to deal with hardware settings: when something already installed isn't working properly and when you want to install a new device.

Something Isn't Working It might be your CD-ROM drive, your sound card, or some other device—it doesn't matter. Before you take your PC to the repair shop, see if Windows can help you fix it. Your secret weapon is the *Windows 95 Device Manager*, which contains a detailed list of every piece of hardware in your PC. If you're lucky, the problem will show up here first.

To start the Device Manager, follow these steps:

- Point to the My Computer icon, click the right mouse-button, and choose Properties from the pop-up menu.
- Click on the Device Manager tab at the top of the dialog box. You'll see a display like the one in the screen at the far right. (Yours won't look exactly like mine, of course.)

Is there a yellow exclamation point over the Device Manager listing for the item you're having trouble with? If so, click on the button labeled Properties. A new dialog box will appear. If the dialog box says there's a problem with the hardware, it's time to call for help.

FYI CONFIGURATION

Because there are so many choices between different components, PCs are almost like snowflakes—no two are exactly alike. *Configuration* is the catchall word that refers to the unique combination of parts in your PC.

I Have a New Device I Want to Install You'll have to plug in the device, but Windows can handle the technical part of it. Double-click on My Computer, then double-click on the Control Panel icon. Finally, double-click on the icon labeled Add New Hardware. You'll see the opening screen for the Wizard that handles all the hardware.

The whole process is about as simple as PCs get. Be sure to tell Windows 95 you want it to detect the new device, and be sure to read the instructions carefully.

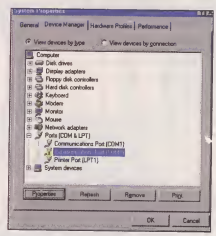
Tip: If you're thinking of buying a new hardware gizmo like a sound card, look for a Windows 95 logo on the package; if you see one, you can be assured that the product will work with your PC. If you don't see the logo, open My Computer and then the Control Panel window. Double-click on the Add New Hardware icon, and tell Windows 95 you don't want it to search for your new hardware. Click on the Next button until you get to the section that lists all the devices. If the sound card you're thinking of buying is listed there, it will probably work just fine with your PC. If it's not there, think twice before buying. And always insist on a money-back guarantee from whoever is selling you the new gadget.

What Does All This Hardware Do? Look carefully at the box Windows 95 comes in, and you'll see a few paragraphs detailing the minimum hardware configuration and the recommended configuration. If your PC doesn't measure up to the minimum standards, you can't run Windows 95 at all. If it falls short of the recommended level, it will run, but it might be painfully slow. Does Windows work OK for you? Then you shouldn't need to worry about it.

Do I Have Enough Horsepower? If your PC had an engine, the CPU and memory would be it. To run Windows 95, you'll need at least a 386 chip and 4MB of RAM. But most people will want a little more computer than that.

How do you know how much CPU and memory you have? Watch your PC's screen when you first turn it on; most computers introduce the CPU and memory information here. The only trick is converting kilobytes into megabytes and vice versa. There are roughly a 1,000 kilobytes in 1 megabyte, so if your PC counts to 4,096K of RAM when you start it up, you really have 4MB. That's the bare minimum you need for Windows 95—8MB is better.

My PC Is Getting Really Slow. What Could Be Wrong? You might be running low on memory. When Windows runs out of RAM, it first tries to use the hard disk to simulate extra memory. Windows takes the chunk of RAM your first program is using and swaps it from memory onto the hard disk (which is about a 1,000 times slower than RAM). That frees up a chunk of RAM for your second program to use, but when you switch back to the first program, Windows has to swap both chunks of data. Add another program, and pretty soon



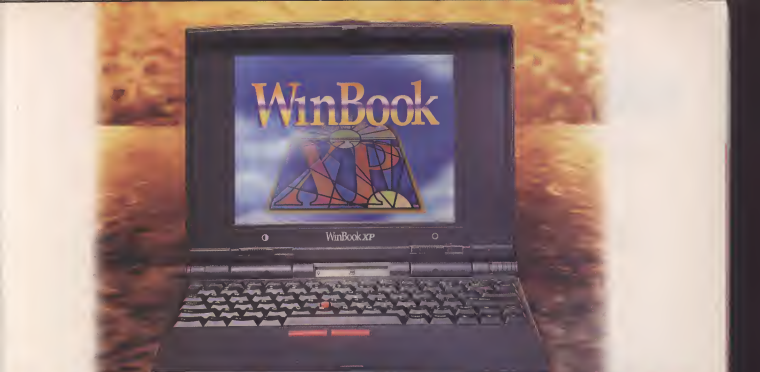
At a Glance: The Windows 95 Device Manager contains a list of all the hardware installed in your system.

Windows is spending all its time swapping data to and from your hard drive instead of running programs. The result is a lot of noise from your hard disk, and a PC that's running in superslow-motion.

It's a clever fake, but anyone who's ever seen an Elvis impersonator knows there's nothing like the real thing. If your system slows to a crawl too often, you need more memory.

Tip: CPU speed is measured in *megahertz*, which stands for 1 million cycles per second. (Each cycle is one little two-step for your CPU; it's not a very complicated move, but because

Continued on page 230



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

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1 PC World — Best Buy - May 1995: WinBook XP (DX2/ 6/360 Monochrome
2 PC World — Best Buy - June 1995: WinBook XP (DX2/ 6/250 Monochrome
3 PC World — Best Buy - July 1995: WinBook XP (DX2/ 8/250 Monochrome
4 PC World — Best Buy - August 1995: WinBook XP (DX2/8/250 Monochrome
5 PC Magazine — Editors' Choice - August 1994: WinBook XP (DX2/6/250 Monochrome
6 PC Laptop — Editors' Choice - Most Improved Portable January 1995: WinBook XP
7 PC World — Best Buy - February 1995: WinBook XP (DX2/6/320 Monochrome
8 PC World — Best Buy - March 1995: WinBook XP (DX2/6/320 Monochrome
9 PC World — Best Buy - April 1995: WinBook XP (DX2/6/320 Monochrome
10 PC World — Best Buy - May 1995: WinBook XP (DX2/6/320 Monochrome
11 PC World — Best Buy - July 1995: WinBook XP (DX2/8/320 Monochrome
12 PC World — Best Buy - August 1995: WinBook XP (DX2/8/320 Monochrome
13 Laptop Buyer's Guide — Best Buy - July 1995: WinBook XP (DX4/75 DD Dual Scan color)
14 PC World — Best Buy - February 1995: WinBook XP (DX4/75 DD Dual Scan color)
15 PC World — Best Buy - March 1995: WinBook XP (DX4/75 DD Dual Scan color)
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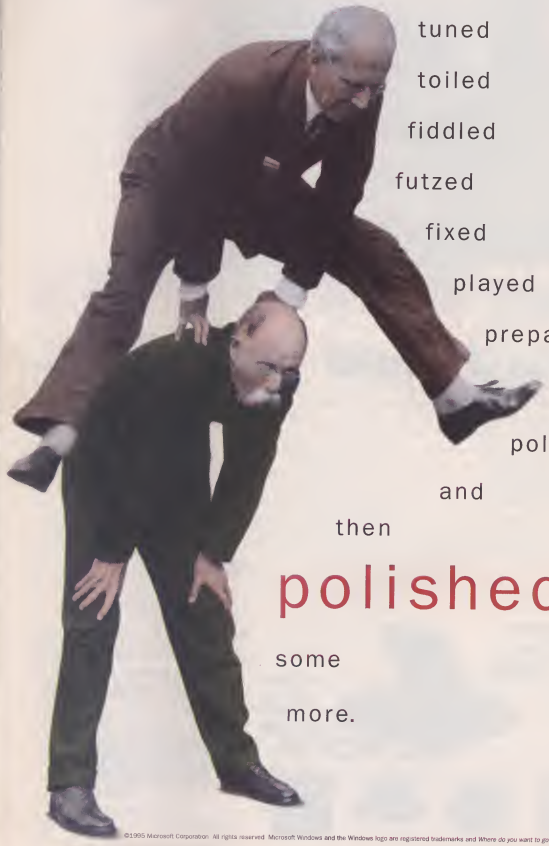
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WHERE DO YOU WANT TO GO TODAY?™

Continued from page 226

some CPUs can do 100 million of these hokeypokeys every second, it looks like it's dancing up a storm.) The more megahertz you have, the more muscle your PC can flex: In Windows 95 terms, 20MHz is slower than a bottle of Heinz ketchup, but 100MHz is faster than a Roger Clemens fastball. If your CPU clocks in at 33MHz or more, you can run Windows 95 just fine.

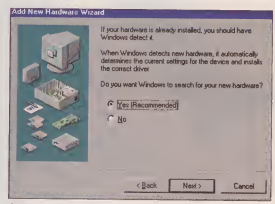
Is My Hard Disk Big Enough? Hard drives are measured in *megabytes*, unless you have a Schwarzenegger-strength system, in which case you might have more than 1,000MB, or a *gigabyte* (pronounce it *gig-uh-bite).* To run Windows and one additional program, you'll need *at least* an 80MB hard drive. And even that won't leave a lot of room for your work. Depending on the kind of software you use and the type of data files you create, you may need 200MB or more.

Tip: If you've run out of disk space, you have another option: You can use Windows 95's built-in disk-compression program, DriveSpace, to pack nearly twice as much data into the same space.

Don't Forget About the Floppy Disk Some older PCs have only one drive designed to use 5.25-inch disks (you can spot these disks because they're big and soft—you can literally bend them in half). These days, most computers use the smaller 3.5-inch disks. If you don't have one of these floppy drives, get one. It's almost impossible to find new software on the larger disks, and the smaller ones are more reliable and durable anyway.

Sometimes the Image Seems Blurry To run Windows 95, you need a color monitor and a VGA card. Windows 95 knows how to identify your video card and set things up so that it works properly. Like TVs, monitor screens are measured diagonally. And they're never, ever, as big as they claim to be.

Caution: There's one place where I draw the line when it comes to saving money on hardware. I won't settle for a crummy monitor, and you shouldn't, either. You're not likely to go blind from using an undersized monitor with a blurry image, but you'll probably go home with a headache every day.



Just Do It: The Add New Hardware Wizard helps you install a new device—for example, a CD-ROM drive, a sound card, or a printer.

Of Course, the Mouse and Keyboard It may seem obvious, but to run Windows 95 you must have a mouse and a keyboard.

Unless you spill a Diet Coke on your keyboard, there's no real reason to replace it, although these days there are all sorts of wacky keyboard designs to choose from. Many of them look like they survived a 7.1 earthquake, with the keyboard split into two pieces. The theory is that you'll be less likely to get carpal tunnel syndrome if you hold your hands sideways while you type. I have a hard enough time making my two fingers hit the keys when I can see them, so I'll stick with the traditional design, thank you very much.

As for *mice* (which is the plural of mouse, although some people say *mouses* and a few wackos say *meeses,* as in "I hate those meeses to pieces"), you have two basic choices. The dull, conventional mouse that comes with most PCs looks like a bar of soap with a long cord dangling out the back. If you don't like sliding the mouse around on your desktop, with or without a mouse pad, try a *trackball.* Unlike the bar-of-soap mouse, which has a roller on the bottom, the trackball has a roller-ball mounted in the top; the whole thing stays in one place while you twiddle the roller with your thumb.

Trackballs are most popular on notebook PCs, where a long dangling cord is likely to get under the wheels of the drink cart as the flight attendant rolls by. Some notebooks have bizarre mouse substitutes that look like pencil erasers or little pads. Not to worry—the point is still to move the pointer on the screen. As long as there's a left and right button, you're in business.

Tip: Is your mouse acting funny, hopping and skipping across the screen, or leaving little "mouse droppings"? If so, you probably have a non-Microsoft mouse, and Windows 95 is having trouble communicating with it. Call the store that sold you that mouse (it probably came with your PC) and ask if there's a new *driver* for Windows 95. (A driver is a small software program that tells Windows 95 how to talk to a piece of hardware.) If they say no, demand to exchange it for a mouse that's compatible with Windows 95.

How to Put Work on Paper Printers help you dazzle other people with your brilliant ideas, even if you can't convince them to come around and look over your shoulder at whatever is on your screen.

Connecting with Other Computers *Modems* let you hook your PC to a telephone line and do all sorts of cool things—send e-mail, find files on your

Continued on page 232

FYI PLUG AND PLAY

Why do they call it Plug and Play? You plug in the hardware, and Windows 95 makes sure it plays properly and doesn't conflict with anything else. It may sound like no big deal, but it is—trust me. If you've ever tried to get a multimedia upgrade kit to work with a PC running Windows 3.1, you'll want to send flowers and candy to the folks who invented Plug and Play.

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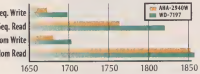
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Continued from page 230

PC at the office without leaving your living room, and cruise up and down the information superhighway. *Network adapters* let you hook your PC to another PC so that both computers can share files, folders, printers, and fax modems. Setting up a network is best left to experts, but using them with Windows is really pretty easy.

Do I Need a Multimedia PC? If you're the one using it, a *multimedia PC* is a powerful tool for adding lifelike sound and video clips to presentations and important documents. If the guy in the next cubicle is using it, though, multimedia is a big waste of money. And if I hear that stupid Homer Simpson sound clip one more time, I'll rip those speakers out of the back of his PC.

Multimedia is controversial. For most people, it's unnecessary but fun. Typical multimedia PCs include a CD-ROM drive, sound card, and pair of speakers.

How Much Hardware Do I Need to Run Windows 95?

I was afraid you were going to ask that. You see, the answer is . . . well, that depends. What do you do with your computer? What kind of data files do you create? How fast is fast enough? How slow is too slow? Do you want instant acceleration, or are you content to mosey along in the slow lane?

See how complicated it gets? Fortunately, there are some pretty easy guidelines to follow, depending on how you plan to use your PC.

The Bare Minimum The official Microsoft-approved minimum setup for a Windows 95 PC includes the following pieces:

- At least a 386 CPU (its full name is the *Intel 80386*, but if you actually own one, feel free to use the nickname instead). You can even have a 386SX, which is the Yugo of CPUs, and still run Windows 95. If your PC has an old 8088 or 286 processor, forget it.
- At least 4MB of RAM.
- At least 40MB of free space on your hard disk.
- A VGA video card and a 14-inch monitor.

Now, that's a minimum configuration. If you don't use your PC very often, and you don't mind waiting, it will work. But if you really tried to use Windows 95 full-time on a PC as computationally challenged as that, you'd probably pound a permanent groove into your desk from drumming your fingers impatiently.

What I'll Really Need If you use your computer a lot and you hate to wait, forget the minimum requirements. You'll need a little more muscle under the hood if you expect your PC to keep up with your work. Here's Microsoft's recommended setup:

- A 486 or better CPU. There are at least eight different chips with 486 in the name; any of them are OK, as long as they zoom along at 33MHz or faster.
- At least 8MB of RAM so you and Windows 95 can do more than one thing at a time. (You can usually add new RAM in chunks of 4MB at a time.)
- A hard disk that's at least 120MB, preferably 200MB or more. The Windows 95 software most people use today chews up hard disk space faster than a starving student chows down at an all-you-can-eat buffet.
- A video card and monitor (at least 15 inches) that can handle a screen resolution of 800 by 600 pixels.

I Don't Care What It Costs. I Want the Fastest, Coolest PC I Can Get The best PC you can use today to run Windows 95 has these pieces inside:

- A Pentium CPU. Intel's Pentium is the fastest and most powerful of computer chips. At 100MHz and up, it's so hot, literally, that you can burn yourself if you touch the chip while the PC is running. (That's one more reason to keep the cover on the PC.)
- For most people, 8MB of RAM is OK, but you'll want 16MB if you do things like scan color photos or publish your own newsletter.
- A Super VGA video card and a bigger monitor. The perfect size these days is 17 inches. Anything smaller doesn't let you see enough on your screen at once. Larger monitors (20 inches and up) cost thousands of dollars and tend to take over your entire desk.
- If you're working with big files such as scanned photos, you're going to need a big hard drive—at least 500MB or even a gigabyte. (That sounds like a lot, but you'll be astounded at how fast disk space can fill up.)

FYI CONSIDERING **ERGONOMICS**

Maybe the most important parts of your PC aren't parts of your PC at all. If you use a computer regularly, you owe it to yourself (and your body) to pay attention to the way you sit in front of your computer.

The human body wasn't designed to handle the stress of nonstop typing. When you twist your body up like a pretzel and pound on a keyboard for hours at a time, the results can be painful, and you can even permanently damage your back, neck, or wrists if you don't use your PC properly.

The most infamous disorder attributed to the stress of computing is called *carpal tunnel syndrome*, a specific kind of repetitive stress injury. The symptoms include debilitating pain in the wrists and, in severe cases, permanent nerve damage. How do you avoid this and other unpleasant PC problems? Ask an expert in ergonomics—the science of designing human-friendly working environments.

Among other things, an ergonomic expert will tell you the following:

- Use a chair that gives you good back support, and make sure it's the right height.
- Give your wrists a rest, literally, with a padded cushion that sits in front of your keyboard. That way, your wrist muscles won't stretch into unnatural, potentially damaging positions.
- Make sure your monitor is at least two feet away from your face, and that you don't have to stretch your neck to view it properly.
- Take a break at least every half an hour. There are even computer programs that will pop up a message every so often to remind you that you've been typing too long.

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Microsoft

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Designed for Windows 95

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Spell-checking now happens on the fly as you type. Misspelled words are underlined so you can correct them as you go. Click on the right button and the AutoCorrect spelling feature learns common mistakes and proper words from you to correct by the software automatically. Grammar is checked in the same way. And you can add or delete words from the idiosyncratic lexicons you have a tendency to make, and the exceptions to grammar and spellings you don't want it to correct. If you override a correction, it adds the word or phrase to its exceptions list and never makes that change again. It has even learned to speak your language. If you have a question, you ask the Answer Wizard in plain English. "How do I make this into two columns?" It gives you step-by-step instructions. You stop working only long enough to type in your question.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

Designed for Microsoft Windows 95

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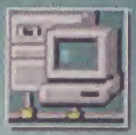


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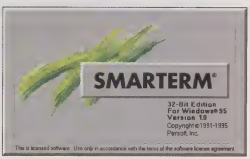


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CUSTOMIZE THE WINDOWS ENVIRONMENT

Make Yourself Comfortable

Your office probably started out looking just like mine: white walls, a cork-covered bulletin board, an empty desk, and some bookshelves—oh yes, a computer, too. Pretty boring, huh? That's why I've added all sorts of personal touches to the environment. Step into my office and you'll find family pictures, a couple of Dilbert cartoons, a wall calendar, a bunch of framed pictures (I'm partial to racehorses), and a coffee mug that says *You Want It When?????*

Just as you can redecorate your office to make it more comfortable, it's no problem to personalize your Windows environment. Replace that boring green background with your favorite picture, change the colors and fonts, even rearrange the display so you can see more details at once. With a few notable exceptions, these changes don't have much of an impact on productivity. They're strictly for fun and visual relief.

If your hardware allows it, you can change the screen *resolution* (in order to relieve your sore eyes) and the *color palette* (to make photographic images look more realistic).

You can also tell Windows to use a *screen saver*, which puts something else on the screen if you haven't touched a key or used the mouse for a while.

Put More Data on the Desktop—Here's How

How much do you want to see on the screen at one time? Well, it depends. This is a personal decision. When you installed Windows, it most likely came up using the normal video settings, where everything on the screen is big and easy to see. If you have the right combination of video card and monitor, though, you can change the resolution (Windows 95 calls it the *desktop area*) and put more pixels on the screen. Is this the right option for you? You'll have to make a trade-off between your eyesight and the convenience of seeing more of your work on the screen.

What If I Change the Resolution? If you've ever looked through the viewfinder of a camera, you understand everything you need to know about screen resolution. Let's say you're taking a group photograph at a family reunion. The resulting photograph is always the same size (just as your computer screen stays a constant size). But depending on where you stand, the image on the photo might look very different.

Stand close to the group and look through the camera—you can get only two or three people in the picture. Take a step back, and Uncle Bill shows up in the frame but everyone looks a little smaller. Go back a few more steps, and you can squeeze in the whole family, including all those cousins and even the family dog, but you'll need a magnifying glass to tell if that's Uncle Bill or Aunt Hillary in the back row.

Each time you increase the resolution of your Windows screen, it's exactly like stepping back to get more into the picture. Eventually, the image will be so small that it won't be usable.

The following list describes the four most common screen-resolution choices:

- **640 by 480 Pixels** This is the normal setting, for users with average eyesight who work with ordinary documents, applications, or games.
- **800 by 600 Pixels** This is a wide-angle setting; use it when you need to cut and paste information between two applications.
- **1,024 by 768 Pixels** The appearance of an extra-wide angle, for users who have big monitors and regularly have lots of windows open at once.

FYI CUSTOMIZING THE **SCREEN PARTS**

Make your mark. Don't settle for somebody else's idea of a good-looking screen. Think of Windows with the default settings—colors, fonts, and desktop configurations—as a new house, without your own furniture or photos on the mantle. Windows lets you personalize practically every part of the workspace so you can feel at home. First pick your favorite colors, then select background patterns, which add texture to whatever color you select. For the perfect ambience, hang a different wallpaper. Are you having trouble reading the labels? Try using different fonts at larger sizes.



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• **1,280 by 1,024 Pixels** Think of it as a view from the Space Shuttle. This is for users who have *really* big monitors and the eyesight of a red-tailed hawk.

How to Adjust the Screen Resolution:

• Right–mouse-button click on any empty spot on the desktop and choose Properties. Click on the Settings tab to reveal all the controls for adjusting the image size and number of colors you can see at once.

• Move the slider to the left to make all the objects on the screen larger and easier to see. Slide it to the right to put more objects on the screen by making everything smaller.

• See a preview of what your changes will look like.

• Choose a color palette. (See the section "How Many Colors do you Need?" below for an explanation of which setting you should choose—and why.)

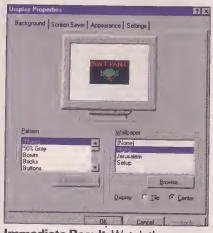
• Choose a font size for Windows 95 objects like icons and menus. Small fonts are neater and let you pack more pixels on the screen. Large fonts are easier to read. Custom fonts are more trouble than they're worth. Your call.

• Change the *Settings* to tell Windows 95 which model and manufacturer of monitor you're using. Don't touch this unless you're sure you know what you're doing.

• Click on Apply to see your changes on the screen immediately.

• Click on OK to accept the changes and close the dialog box.

• Click on Cancel to stop fooling around and get back to work.



Immediate Result: Watch the preview screen for changes you apply in the Display Properties dialog box.

PLAIN ENGLISH A COLORFUL RESOLUTION

Pixels are the small dots of color that make up the image on your screen, and resolution is simply a fancy term for the number of dots that Windows 95 displays on a single screen. Resolution is usually expressed as a measurement—when we refer to 640 by 480 resolution, that means a display with room for 640 dots from side to side and 480 dots from top to bottom. Increasing the resolution while using the same monitor means that everything on the screen appears smaller, so you can see more words, numbers, pictures . . . whatever you're working with. Although a higher resolution may look sharper, it also requires that you have good eyesight. If you keep squinting at the monitor, select the lower resolution.

Caution: Unless you're absolutely sure you know what you're doing, don't touch the button labeled Change Display Type. If you do, and you also specify the wrong monitor type, you could end up sending a signal to the monitor that causes some of its innards to literally go up in a puff of smoke. Thanks to Plug and Play, Windows 95 will probably set up the monitor correctly.

How Many Colors Do I Need? Setting the Windows 95 color palette is like shopping for paint to redo your living room. At the lowest setting in the Display Properties sheet, you get your choice of 16 colors that can appear on the screen at the same time. That's like doing the walls, trim, and all the furniture and decorations using only the colors you selected from the sale shelf at the Sherwin-Williams store. It's not a heck of a lot of choices, but you can probably find something you'll like.

When you boost the level to 256 colors, it's like having your choice of any combination of colors from the ready-mixed selection in the paint store. In practice, since you're doing the walls and the trim and the furniture and decorations, that means tens of thousands of combinations. Surely you'll find something you like in there.

If you have an expensive video card and monitor, you can boost the color resolution to *High Color* (65,536 colors) or even *True Color* (16.7 million colors). That's the equivalent of bringing in your own swatches of color and asking the paint store to match them molecule for molecule.

Why not choose the highest number? Because it slows down your screen. Windows has to search through the entire list of colors and calculate all those bits for every dot on the screen, which uses a tremendous amount of computing power. And while Windows is getting a headache sorting through all those colors, it can't do anything else.

For most of us, 256 colors is about right. It offers enough color options to look good most of the time, but not so many that Windows will neglect the rest of its work while it's sorting through the color palette.

Besides, can you really put 16.7 million colors on the screen? Do they all have names? (Hey, Binney & Smith, maker of Crayola crayons, had to use strange names like Raw Umber when it got up to 64 crayons, so what would you end up with in a box with 16.7 million colors?) The only time you'll really want to use lots of colors is when you're working with *digital images* (like the photographs found on Kodak Photo CDs); then you'll appreciate the smoother, sharper, more realistic images. For most day-to-day work, 256 is *puh-lenty* of colors.

Tip: Why does the color palette change when you change the resolution? Your video card doesn't have enough memory to handle all those colors at all resolutions. If you want to see photos in true color, you may have to choose the smallest desktop area—640 by 480. If you want to pack more pixels on the screen—at 1,024 by 768, for example—you'll have to settle for fewer colors.

Continued on page 246

Fully optimized for Windows 95, ATI's *mach64* graphics and multimedia accelerators provide blazing 64-bit speed, razor-sharp resolution up to 1600x1200[1], brilliant 16.7 million colors, flicker-free 100Hz display and the most comprehensive feature set available. Designed for maximum performance and compatibility, ATI's *mach64* GRAPHICS XPRESSION, WINTURBO and GRAPHICS PRO TURBO are your best choice for Windows 95.

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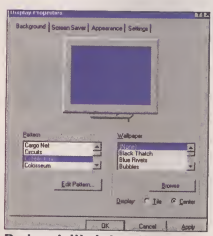
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Continued from page 242

Decking the Walls

I don't like wallpaper. If I bought a new house and discovered that the kitchen walls had been covered with quaint country scenes, I'd spend days scraping it off and repainting. Fortunately, changing the wallpaper in Windows doesn't require a belt sander. Just right-mouse-button click on the desktop, choose Properties, then click on the Display tab, and you can redecorate in a few seconds.

Wallpaper? Patterns? Huh? When it's time to redecorate your desktop, you have the same kinds of choices you have in your house. You can choose to use a single color for the background, just as you might want to paint the walls canary yellow. Or you can add artwork—images or patterns—to make the background more interesting.



Designer's Workshop: Use the Display Properties dialog box to change the background pattern.

Windows 95 gives you two choices for images. Background *patterns* are simple, repeating arrangements of black pixels that create a design when viewed together—like a fancy tile pattern for a kitchen countertop or floor.

Wallpaper, on the other hand, is an actual graphic image, such as a photograph or drawing, that covers up the background color you've chosen. You can center a single image on your desktop, just as you would hang a large painting on the living-room wall; or you can choose a smaller image and let Windows 95 duplicate it to cover the entire surface of the desktop.

Wallpaper is always a separate image file, stored in a format that Windows can recognize. Typically, this is the *bitmap image format*.

Caution: Wallpaper and background patterns can make your screen look as sophisticated as the Museum of Modern Art, but they can also make it difficult or impossible to see icons on the desktop. If you choose an intricate wallpaper pattern, be prepared to squint.

I Want a Clean Screen No problem. Just make sure that *None* is selected in both list boxes. You'll see a plain background with only the colors you've selected—no patterns or pictures.

I Want to Break Up This Boring Color Then use one of the Windows background patterns. These work just like a decorative pattern on a kitchen tile. The base color of the tile may be different, but the pattern itself is always black. Choose a pattern from the list, then look in the preview screen to see what it will look like. Or you can take a close-up look at the pattern (and even make changes to it) by clicking on the Edit Pattern button. Note that each big block is a pixel. Click on a pixel once to turn it black; click on it again to restore it to the default background color. Enter a new name for your pattern. If you don't, Windows assumes you want to replace the existing pattern.

The Big Picture When you have a favorite image stored in bitmap format (that is, with the extension .BMP), why not use it as the Windows 95 wallpaper? If the image is big enough to take over the screen, then check the Center option in the Wallpaper box. Windows will neatly position the image so it's perfectly centered on your screen.

Some people like to use an image that's slightly smaller than the full screen, as shown at top right. That way they can arrange desktop icons like My Computer and the Recycle Bin without having to squint to pick them out against the background image.



Return to Center! When you ask Windows to center an image as wallpaper, it does just that, revealing the desktop behind.

The Tiled Look: Bricks and Boxes Take your favorite postage stamp, put it in a frame measuring 2 feet on each side, and hang it on your living room wall. What happens? The stamp practically disappears, of course. The same thing happens if you take a small bitmap image, just 20 or 30 pixels on each side, and try centering it on your screen. The tiny image is overwhelmed by that big desktop.

To make the framed image stand out on your wall, you could use an entire sheet of stamps instead of just one. You can do the same with a bitmap wallpaper image. When you check the Tile option, Windows 95 copies your original image and uses the copies to fill the entire screen. The repetition makes a much better visual impact, because the image gets to fill a proper amount of space.



Lonesome Tonight: An image can look lonely when centered on the screen. Choose the Tile option and Windows repeats the image.



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Tip: When you're experimenting with different desktop options, use the Apply button instead of OK. That way, you can check out different looks without constantly clicking mouse buttons to reopen the Display Properties box.

Where to Find Wallpapers If you're looking for wallpaper, you can find interesting images just about anywhere. Windows comes with some of its own, including my personal favorites, Gold Weave and Sandstone, which look great as tiled backgrounds. For a pretty, full-screen image, check out the Clouds file. All three, plus a lot more, can be found in the Windows folder.

Tip: Can't find the Wallpaper files? You probably didn't install them. To put them on your hard disk, you must go through the following tedious steps. Click on the Start button, choose Settings, and click on Add/Remove Programs. Select the Windows Setup tab, highlight Accessories, click on Details, and (finally!) check the Desktop Wallpaper box. Click on OK to copy the desktop wallpaper to your hard disk.

You can find other images—everything from animals to space shots—in art and photo collections available from a variety of sources: CD-ROMs, online services like CompuServe and Microsoft Network, and even the Internet (that's where I discovered those hip Elvis postage stamps).

You can even make your own wallpaper with the Windows Paint program if you have a little artistic talent. After you've created and saved the Paint image, look on the File menu for the two Set as Wallpaper options.

Redoing the Color (and Font) Schemes

The Windows default colors are pretty boring: dark green, blue, white. Yawn. It's almost as bad as a model house, which is designed to be safe and bland so as not to offend anyone.

Want a different look and feel? A purple background? Lime-green title bars? Red letters? Hey, it's your computer. You can use any color you like, and you can even replace the fonts Windows 95 uses for the labels on icons and folders.

Windows 95 comes with a predefined collection of desktop arrangements, with different coordinated colors and fonts. These collections are called *schemes*, and you can find them in the Display Properties dialog box. If you find a scheme that has some elements you like, use it as the base for your own desktop. Start with the ready-made choices, then add your own options and save the edited scheme under a new name of your choosing.

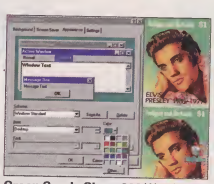


Color by Pixels: Don't see the precise color you're looking for? Use the Custom Colors dialog box to mix it yourself.

Tip: If you're not sure what a part of the desktop is called, look in the preview window. All the parts of this window are live; if you click on the menu bar, for example, it selects the Menu option in the Item list so you can adjust its size, color, and associated font.

Where Did My Colors Go? It doesn't matter how many colors you've told Windows you want to use. When you pull down the color widget in the Display Properties dialog box, you only see 20. What happened to the others? Well, you'll have to mix them yourself. Here's how:

- Click on the Color drop-down arrow, then on the Other button. You get an expanded list of 48 colors to choose from.
- Still can't find the right color? Click on one of the empty squares in the section labeled Custom Colors; this is where you'll store the new color you're about to create.
- Move the black *crosshairs* from side to side in the color matrix to shift along the spectrum from red to yellow to green to blue, and so on. Moving the crosshairs up and down changes the intensity of the color.
- Having trouble seeing any colors? You might need to adjust the amount of black or white in the image. Drag down the vertical slider to add more black; push it up to add white. But stay somewhere in the middle; if you go all the way to the top or bottom, all your color will disappear.
- Preview your color in the box just below the color matrix. When you're happy with the look, click on the button labeled Add to Custom Colors, then click on OK to exit.



Green Suede Shoes??? Watch the example screen change colors. If you're not happy, click on Cancel.

Caution: If you accidentally make the background and foreground colors the same, you won't be able to see what you're doing. To fix it, just go to the desktop and restore the Windows Standard scheme.

I Can't Read These Labels Then change the font size. The normal size for window titles, for example, is 8 point. Try bumping it up to 9 or 10 point to make the labels more readable.

These Buttons Are Too Small! You won't find a setting for adjusting the Minimize, Maximize, and Close buttons. But you can adjust their size just the same. When you change the size of the type in the Active and Inactive title bars, the size of the buttons changes, too. To make the buttons bigger, just make the title-bar font bigger.

Continued on page 252

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Oops—That's Ugly. How Do I Get It Back to Normal? Don't like that purple and lime green after all? I don't blame you. Open the Display Properties sheet and choose one of the predefined schemes stored there. You can always get back to normal by choosing Windows Standard from the list of schemes on the Appearance page.

Tip: After fiddling with fonts and colors, if you find a group of settings you really like, save it. Give it a name like Favorite Colors. Then, if something happens to your settings, you can always restore the ones you know you like.

Installing a Screen Saver

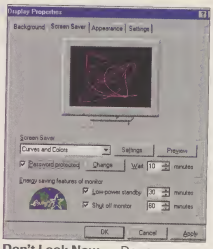
Computer old-timers will tell you that screen savers are necessary to prevent characters from "burning into" your monitor. That used to be true, but it isn't anymore. Still, there are two reasons to use a screen saver: for fun and for privacy.

The concept behind a screen saver is simple. When you tell Windows to use a screen saver, it starts a timer each time you tap a key or click a mouse button. When a predetermined amount of time passes without any action, Windows replaces whatever is on the screen with the screen-saver image, usually something that moves.

My favorite screen saver is called Curves and Colors, which draws fancy, looping, geometric shapes called *Bezier curves* on the screen. To install it, click on the Screen Saver tab in the Display Properties dialog box.

The following list describes what the options do. As usual, the sample screen shows how the various settings will look after you choose OK.

- **Screen Saver** Pick the screen saver you want from this list.
- **Settings** Set preferences here—for example, how fast the image moves and which colors it uses.
- **Password Protected** Enter an optional password here. Once the screen saver kicks in, you'll have to enter this password before you can get back to work. This feature is handy if you want to be able to walk away from your desk without worrying about snoopy coworkers.
- **Wait** Tells Windows how long you want it to wait before turning on the screen saver. The default setting of 1 minute is a little quick. Try 5 or 10 minutes for starters.
- **Preview** Click on this button to see a full-screen demonstration of the screen saver in action.
- **Energy-Saving Features of Monitor** The Energy Star section lets you tell Windows to shut down your monitor (saving power) after a certain length of time. (This option is available only for monitors that support this feature.)



Don't Look Now . . . Do you see this screen saver? You are getting sleepy, very sleepy . . .

Fine-tuning the Mouse

Most people don't realize that you can also change the mouse pointers that come with Windows 95. And that's just one of the changes that are possible. If you sometimes have trouble picking out the pointer on your screen, double-click on the Mouse icon in the Control Panel.

Here are some things you can adjust:

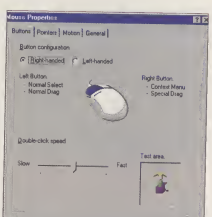
- **I'm a Lefty** Click on the Buttons tab and tell Windows 95 you want to switch the functions of the left and right mouse buttons.
- **I Have Trouble Double-Clicking** Tell Windows to be more patient. Look for the Double-click speed control on the Buttons tab. Move the slider to the left to make Windows 95 less sensitive, then test the new double-click rate on the jack-in-the-box at the right.
- **Mouse Pointers Are Too Small** Pick new pointers from the pointer-scheme list box. The Windows Standard variety includes large and extra large sizes.
- **The Pointer Moves Too Fast or Too Slow** Click on the Motion tab and slide the Pointer Speed control in the appropriate direction.
- **Sometimes I Lose Track of the Mouse Pointer** Try adjusting the Pointer Trail settings on the Motion tab. This option is especially useful on notebook computers.

Changing the Date and Time

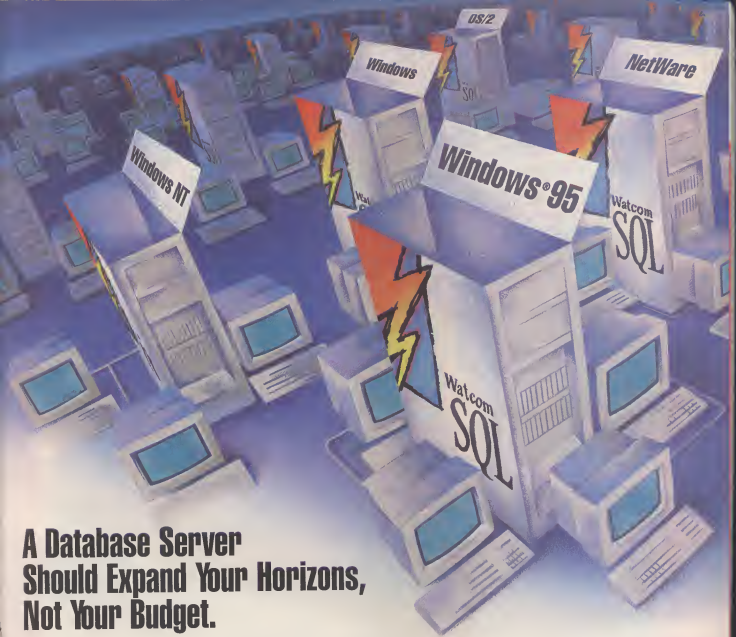
Not every PC keeps perfect time. If you notice that the time on the Taskbar isn't quite right, reset it. Right-mouse-button click on the time display and choose Adjust Date/Time. Enter a new date or time, if necessary, and Windows 95 will reset the system clock as well as the display.

Why does Windows care what time zone you're in? It can be important if you dial in to a network that's in another time zone, or if you send e-mail out over the Internet, where it might be received by someone in Afghanistan. As long as both computers know about time zones, they'll be able to keep track of which file or message came first.

Tip: If your PC loses track of the right time at an alarming rate, try this trick: Drag a shortcut of the Date/Time icon from the Control Panel into the Startup folder. That way, every time you turn on your PC, you have a chance to reset the clock.



Mousing Around: Adjust mouse options to make it easier for you to see that pesky pointer.



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For years, millions of people worldwide have relied on MS-DOS®, Windows® and Windows® for Workgroups operating systems to help them work better and accomplish more. Now, even more people will go even farther with the next generation successor to these systems—Microsoft® Windows® 95. For computer users everywhere, it's a giant leap forward.



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Minimum system requirements: 386DX CPU, 4MB RAM (8MB recommended), 15-50MB hard disk space, VGA-compatible graphics adapter and monitor. Microsoft Exchange and The Microsoft Network (MSN) require 8MB RAM and 25MB of additional hard disk space (MSN also requires a modem). Full benefits of preemptive multitasking require exclusive use of 32-bit Windows-based programs, such as products bearing the Designed for Windows 95 logo.

[1] One free $25.00 CDW electronic coupon with purchase of each copy of Windows 95 upgrade, license or full product before 12/31/95. CDW electronic coupon can be redeemed on any purchase of $750.00 or more on a single invoice, one $25.00 coupon per $750.00 purchased. CDW coupons are issued electronically at time of purchase, and will be redeemed automatically on qualifying purchases. CDW $25.00 electronic coupon expires 12/31/96.

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That's why upgrading your memory is critical for running Windows® 95 and other new 32-bit applications.

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To determine how much RAM your system needs, add the minimum amounts of required RAM for each application you use. Typical users will need at least 8MB to run Windows® 95 with one or two applications, 16MB for true multitasking of business applications, and 32MB or more for desktop publishing and multimedia.

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4MB	$249.90	55286
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8MB	$408.32	52716
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IBM ThinkPad 500/510Cs

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IBM ThinkPad 755

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32MB	$1159.90	43309

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12MB	$621.76	43231
16MB	$749.23	31342
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32MB	$1535.33	43041

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NEW V.34!

U.S. Robotics Sportster Vi 28.8 V.34 Faxmodem with voice mail

Your personal office message center

The Sportster Vi puts the convenience of a reliable U.S. Robotics modem, answering machine and fax machine in one compact unit—and it's easy to use, right from your home or office PC. Powerful voice processing capabilities and personal conferencing software lets you see what's happening to your document while talking about it. With the Sportster Vi, you can transmit data files during regular voice calls, set up a business-quality voice mail system with multiple mail boxes, and retrieve voice and fax messages from remote locations.

▼ Data: V.34 and V.FC® (28.8K bps) and V.32bis (14.4K bps)
▼ Fax: 14.4K bps send/receive ▼ V.42/MNP 2-4 error control
▼ V.42 bis/MNP 5 data compression for throughput up to 115,200 bps
▼ Internal versions include built-in 16550 UART ▼ Digitally records voice messages, no tape to rewind or break ▼ Play and record messages through your phone or external speaker and microphone jacks ▼ Fax on Demand Menu lets callers choose documents to be faxed automatically ▼ Send group and delayed faxes ▼ While talking on a single phone line, you can simultaneously:
- Run remote control software
- Transfer files
- Edit word processing documents
- Update spreadsheets
- Modify still images and graphics
- Play interactive games

▼ Includes voice mail, fax and data communications software for Windows, phone card, external power adapter, quick installation guide
▼ 5 year limited warranty



Internal	$208.70	CDW 54076
External	$225.33	CDW 55428
Sportster Vi 14.4 internal	$113.59	CDW 54075
Sportster Vi 14.4 external	$133.78	CDW 54080
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◆ **Quality** industry-leading Motorola engineering ◆ **Easy** Connects directly to Motorola MC® flip phones—no extra connection hardware or cables required ◆ **Fast** data transmission rates up to 57,600 bps using built-in V.42bis data compression ◆ **Efficient** error correction for reliable, trouble-free data and fax communications ◆ **Secure** password and callback security features ◆ **Communicate longer** low power operation mode

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◆ **Quality** unparalleled Motorola quality and reliability ◆ **Easy** Plug and Play (PnP) compatible ◆ **Fast** data transmission rates up to 57,600 bps using built-in V.42bis data compression ◆ **Efficient** error correction for reliable, trouble-free data and fax communications ◆ **Cellular upgradeable** easily upgrades to work over cellular networks

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Motorola Lifestyle 28.8 V.34 data and fax modems

NEW V.34!



◆ **Quality** unparalleled Motorola quality and reliability ◆ **Easy** Plug and Play (PnP) compatible ◆ **Fast** send and receive data at rates up to 115,200 bps using built-in V.42bis data compression ◆ **Efficient** error correction for clear faxes and reliable data every time ◆ **Secure** password and callback security features

Internal	$187.20	CDW 57196
External	$196.38	CDW 54591

Motorola BitSURFR Series ISDN terminal adapter

NEW



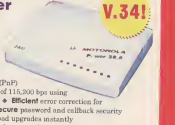
What can you do with a **BitSURFR** ISDN terminal adapter? Everything you can with a modem, just better, faster and cheaper!

◆ Access data at up to 128K bps: more than twice as fast as the fastest analog modems! ◆ Hassle-free ISDN service set-up: in-the-box ordering codes tell your phone company how to set up your ISDN line ◆ Simultaneous voice and data support: surf the net and talk on the phone or send a fax at the same time with the included analog port feature for conventional telephones and modems ◆ Complete ISDN solution—no further equipment required ◆ Plug and Play (PnP) compatible

TA210 ..... $346.37 CDW 56591

Motorola Power Class 28.8 V.34 desktop modem

V.34!



◆ **Caller ID** find out who is calling you (requires Caller ID service from your local telephone company) ◆ **Easy** Plug and Play (PnP) compatible ◆ **Fast** top data rates of 115,200 bps using built-in V.42bis data compression ◆ **Efficient** error correction for reliable data and clear faxes ◆ **Secure** password and callback security features ◆ **Flash Memory** download upgrades instantly ◆ **Distinctive Ring** data, fax and voice on one line

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Extraordinary value and performance



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◆ IntelDX4, 75MHz CPU ◆ 4MB RAM std., 32MB max. ◆ 10.4" dual-scan color display (450) ◆ 9.5" TFT active-matrix color display (450T) ◆ 340MB removable hard drive ◆ PC Card (PCMCIA) slot: 1) Type II ◆ Touchpad pointing device ◆ Ports: parallel, serial infrared, PS/2 ◆ NiMH battery ◆ Weight: 5 lbs.

EXTENSA 550, 550CD, 550CDT

◆ Intel 75MHz Pentium® processor ◆ PCI bus, 256KB L2 cache ◆ 8MB RAM std., 40MB max. ◆ 10.4" dual-scan display (550, 550CD) ◆ 10.4" TFT active-matrix color display (550CDT) ◆ 524MB removable hard drive ◆ Removable CD-ROM and floppy-disk drive (550CD, 550CDT) ◆ Integrated 16-bit sound (550CD, 550CDT) ◆ PC Card (PCMCIA) slot: 2) Type II or 1) Type III ◆ Touchpad pointing device ◆ Ports: parallel, serial infrared, PS/2, external monitor, audio in/out, microphone in ◆ NiMH battery ◆ Weight: 6.4 lbs.

450, 340MB	450T, 340MB	550, 524MB	500CD, 524MB	550CDT, 524MB
CALL!	CALL!	CALL!	CALL!	CALL!



IBM® ThinkPad® 701C

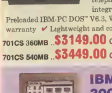
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The no-compromise subnotebook

✔ IntelDX4™ 75MHz CPU ✔ 8MB RAM, 24MB max. ✔ 10.4" dual-scan color display (701CS) ✔ 10.4" active-matrix color display (701C) ✔ Local bus video with 1MB RAM ✔ PCMCIA: accepts 2) Type II or 1) Type III ✔ 14.4K bps fax/modem with voice and telephony ✔ 85-key expandable keyboard ✔ Keyboard-integrated pointing device ✔ Super NiCD battery ✔ Preloaded IBM PC DOS® V6.3, Windows® V3.11 and IBM OS/2 Warp V3.0 ✔ 3 year warranty ✔ Lightweight and compact: 4.5 lbs, 9.7" x 7.9" x 1.7"

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P/90	540MB	16MB	1)PCI, 2)ISA	3	54250	$2370.00
P/90	850MB	16MB	1)PCI, 2)ISA	3	54251	$2685.00
P/75	540MB	8MB	2)PCI, 3)ISA	5	54252	$1980.00
P/75	540MB	16MB	2)PCI, 3)ISA	5	54253	$2525.00
P/75	850MB	16MB	2)PCI, 3)ISA	5	54254	$2340.00
P/90	540MB	16MB	2)PCI, 3)ISA	5	54258	$2829.00
P/90	850MB	16MB	2)PCI, 3)ISA	5	54257	$2745.00

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✔ IntelDX4™ 100MHz CPU (755CE, 755CSE, 755CD, 755CDV, 755CV) ✔ IntelDX4™ 75MHz CPU (755C) ✔ Intel Pentium® processor, 75MHz with 256KB L2 cache (755CX) ✔ 8MB RAM std, 40MB max. (755CE, 755CSE, 755CD, 755CDV, 755CV) ✔ 4MB RAM std., 36MB max. (755C) ✔ Removable 340MB, 540MB or 810MB hard drives ✔ 10.4 TFT active matrix color display (755CE, 755C, 755CD, 755CX, 755CDV, 755CV) ✔ 10.4 STN dual-scan color display (755CSE) ✔ 755CDV and 755CV displays feature removable back panels, and double as overhead projection display panels ✔ 32-bit accelerated local bus video, 1MB RAM ✔ 755CDV features motion video acceleration software, NTSC and PAL video out, and video in/out jacks (S-video and composite) ✔ PCMCIA slot: 1) Type III or 2) Type II or 1 ✔ 755CD and 755CDV only: integrated 2X CD-ROM drive, accepts 5.25" discs (swaps with included 3.5" floppy drive) ✔ Integrated TrackPoint™ pointing device ✔ Intelligent NiMH battery ✔ 755CX models (except SB2) feature Lithium Ion battery ✔ Pre-installed PC DOS, Microsoft Windows, Lotus Organizer and more ✔ 755CX, 755CDV, 755CV also feature pre-installed OS/2 Warp V3 0 with BonusPak ✔ Weight: 6.4lbs or less ✔ 3-year warranty



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Integrated Mwave DSP communications:

✔ 14.4K data/fax modem ✔ Full-duplex speakerphone and voice mail system

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755CSE, 340MB	$3499.00 CDW 46090	755CX (SB2), 540MB	$4749.00 CDW 56197
755CSE, 540MB	$3849.00 CDW 46097	755CX, 540MB	$5799.00 CDW 53825
755CE, 540MB	$4649.00 CDW 46361	755CX, 810MB	$6249.00 CDW 53826
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CorelDRAW 6 for Windows 95

The world's premier 32-bit graphics application



With the speed and accuracy of 32-bit architecture, CorelDRAW 6 provides precision to 0.1 micron, multi-threading, multi-tasking and a workspace of more than 150 by 150 feet. Support for Multiple Document Interface (MDI) allows users to open several documents at once, or multiple views of a single document. CorelDRAW 6 has a fully-customizable user interface allowing easy organization of toolbars, hotkeys, roll-ups and status bars, plus Wizards and Tutor Notes. CorelDRAW 6 offers fully-featured software applications for illustration, photo-editing and bitmap creation, business and multimedia presentations and 3D rendering.

Includes:

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● 25,000+ clipart images and symbols ● 1000+ TrueType and Type 1 fonts ● 1000+ photos ● 3D models ● 50 CorelDRAW templates ● 300+ seamless tiles for textures ● 125+ brushes ● 260+ video or animation files ● 1270+ actors ● 200+ props ● 70+ sounds ● 50+ floating objects ● 90+ chart types ● 300+ presentation backgrounds

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Upgrade from CorelDRAW 4 or CorelDRAW 3 ..... **$358.20** CDW 55737

CD ..... **$432.78** CDW 55736

Panasonic Office Automation

NEW

Panasonic KXP-6100 Laser Printer for Windows

Quick, affordable 6PPM laser printer

Specifically designed for Windows® users, the KX-P6100 receives its print commands directly from your computer. The KX-P6100 offers speedy output, laser-quality resolution, easy-to-use interactive help screens, and versatile document creation options. Ideal for 486 or Pentium™ computer users.

✔ 300 x 300 dpi— 600 dpi class output with Edge Enhancement Technology™ ✔ 6ppm print speed ✔ Interface: bi-directional parallel ✔ Semi-automatic duplexing ✔ On-screen interactive help ✔ Enhancements to printer made through user-installable software ✔ Paper handling: 100 sheets letter, 30 sheets of labels, 30 transparencies, 10 envelopes ✔ Features Panasonic's new Concorde engine ✔ Size: 5.2"x14.9"x11.3"



ONLY **$399.00** CDW 55117

Hardware requirements: PC compatible 486SX, 4MB RAM (8MB or more recommended), 4MB hard disk space, parallel printer port

Software requirements: MS-DOS V3.3 or later, MS Windows® V3.1 or later, permanent virtual memory (PC RAM plus virtual memory must equal 16.5MB or more)

KX-P6500

High-performance, affordable 600 dpi printer

◆ 600 x 600 dpi output ◆ 1200 dpi class output with Edge Enhancement Technology™ in the Windows mode ◆ On-screen interactive help ◆ 6ppm— 50% faster than other entry level 600 x 600 dpi printers ◆ Semi-automatic duplexing ◆ Paper handling: 100 sheets letter, 30 sheets of labels, 30 transparencies, 10 envelopes ◆ Features Panasonic's new Concorde engine ◆ Size: 5.2"x14.9"x11.3

NEW

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New!

Stylus Color Pro

The next step in color inkjet printers

▼ Maximum resolution: 720 x 720 dpi black and white or color on plain paper with Microdot technology ▼ Maximum print speed: 3 ppm ▼ Fonts: 4 scaleable, 5 LQ ▼ Paper capacity: 100 sheets ▼ Paper types: plain paper, labels, envelopes, transparencies, Epson 360, 720 and high quality glossy ▼ Paper sizes: letter, legal, A4, B5, statement, executive ▼ Maximum print area: 8.03" x 10.33" (letter) ▼ Parallel and serial interfaces ▼ 2 year warranty

720 dpi *black and white or color!*

ONLY **CALL!** CDW 57352

Stylus Color II

High resolution color inkjet printer

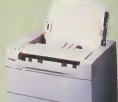
New!

◆ Maximum resolution: 720 x 720 dpi black on plain paper, 720 x 720 dpi color on specially coated paper ◆ Maximum print speed: 3.5 ppm ◆ Fonts: 4 scaleable, 3 LQ ◆ Paper capacity: 100 sheets ◆ Paper types: plain paper, labels, envelopes, transparencies, Epson 360, 720 and high quality glossy ◆ Paper sizes: letter, legal, A4, B5, statement, executive ◆ Maximum print area: 8.03" x 10.34" (letter) ◆ Parallel and serial interfaces ◆ 2 year warranty

ONLY **CALL!** CDW 57348

ActionLaser 1400

600 dpi quality at a personal price



▼ 600 dpi, 4 ppm print speed ▼ 2MB RAM std., with image compression technology ▼ Enhanced PCL 5 emulation, 45 scaleable fonts ▼ Control panel software for Windows® and DOS ▼ 100 sheet paper tray: letter, legal or envelope ▼ Energy Star compliant

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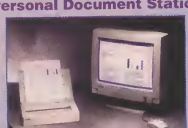


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WORKING WITH PROGRAMS AND FILES

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How you use your computer is a matter of personal preference—in much the same way that cooking shows off your individual style. Do you lay out all the cast-iron pots and stainless-steel mixing bowls before you start preparing a gourmet dinner? Or do you clean and chop every ingredient first, then go looking for the utensils? Or do you call Pizza Man to have a pizza delivered?

Everyone has a different style of working, and Windows is nothing if not flexible. In this chapter, Ed Bott explains how to rearrange the programs you use most often and how to group your working documents into efficient folders. In short, how to organize things so you can find them with as little fuss as possible.

It's Important to Know Your Working Style

Where do you start? Well, it helps to know how you prefer to work. Do you tend to create a bunch of new documents, work with them for a few minutes or hours, and then move on? Or do you work with the same set of documents for days or weeks at a time? It also helps to know how you can use Windows to keep your programs and documents close at hand.

How should you organize your work with Windows? Which techniques will make you most productive? That depends on whether you prefer to start with documents or with the programs that create them. From the two choices below, pick the statement that best describes the way you work, then read the guidelines that follow.

I Know Which Program I Want to Start With Every program on your hard disk has an executable file. When you double-click on this file, your program starts. Your organizational challenge is to find the program, start it up, and then use the program's File menu to create a new document or look for one you've already used. The trouble is, these executable files are scattered all over your hard disk, and you don't want to go searching for them every time you want to start a program.

I Know Which Document I Want to Start With What's in a document file? Well, all your data is there—words, numbers, pictures, and so on. The file has a name that, presumably, describes the contents. There's also information in the file that tells Windows about the program that created that data file. Once you find the document, just double-click on its icon and trust that Windows can figure out which program it needs to run to start the file. Here's the problem: if you've organized your hard disk into a collection of folders inside folders inside more folders, you could spend your whole day just searching for documents.

Windows 95 Knows Your (File) Type

When you double-click on a file, Windows has to make some fast decisions: What kind of file is it? Which program created it? Is that program running right now? If not, where is it?

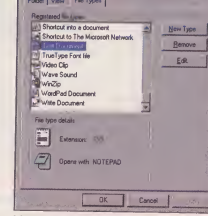
To answer all those questions, Windows maintains a list of file types, with each entry containing three pieces of information: a descriptive name, a file extension, and the name of the program Windows 95 should start when you want to use that kind of file.

Let's look at what happens after you create a file with Notepad. (Make sure to give it a long filename like Important Notepad Document.) Open a folder window, right-click on the name of the file you just created, and inspect its Properties. You'll see plenty of information about its file type. Just below its icon, after the word *Type*, you'll see the words *Text Document*. That's the descriptive name.

Now look a few lines lower on the Properties sheet, next to the entry for the MS-DOS name. You'll see a clipped-off version of your long filename that ends in a period followed by three letters. In this case, those three letters are TXT, which is the file extension that Windows tacks onto the end of every file classified as a Text Document.

Those little three-character stragglers are annoying and confusing most of the time, so Windows hides them by default. But it doesn't actually get rid of them because that is how it knows to use Notepad to open those files. To see where that association between the file type and program is stored, open any folder window, choose View, Options, and click on the File Types tab. Scroll through the list until you get to the entry called Text Document.

When you double-click on a file in a folder, Windows checks its list of File Types to see what it's supposed to do next. If it knows how to handle that file



I Know You! When you double-click on a file, Windows looks in this list to see what it's supposed to do next.

Continued on page 264

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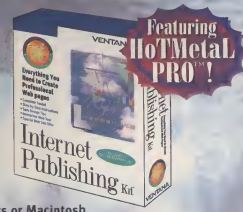
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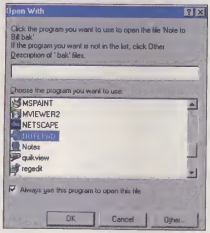
Continued from page 260

type, it starts the program and loads the file. If it doesn't know how to handle the file type, it asks you what to do.

Tip: If your program isn't in the list, click on the button labeled Other and find the icon for the program you want to use. Click on Open to add that program to the list. Then click on OK to associate it with the file you want to edit.

Add a Shortcut to Get to What You Need

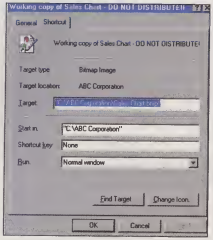
Instead of forcing you to search for programs and documents all over your hard disk, Windows lets you create shortcuts to both. A shortcut is a special sort of icon containing instructions that tell Windows exactly where it can find a particular file. And because you can create



Identified: If Windows doesn't recognize the file you want to open, introduce them to each other here.

more than one shortcut for any file, you can have the best of both worlds: Keep your hard disk organized the way you want it, then use shortcuts to temporarily pull together groups of programs and documents into one convenient location.

When you right-click on a shortcut and choose Properties, you'll get a helpful dialog box. Notice that the name of the shortcut doesn't have to match the name of the file it points to. That makes it easy to label a shortcut with a descriptive name (like Working Copy of Sales Chart) without changing the original filename (Sales Chart).



Smart Pointers: Shortcuts help you get to any program, anywhere, quickly and efficiently.

You can use shortcuts just about anywhere in Windows. They're particularly useful in these places:

- **Add a Shortcut to the Start Menu** Just drag a file and drop it on the Start button.
- **Put a Shortcut on the Desktop** Using the right mouse-button, drag one or more files out of a folder and onto the desktop, then choose Create Shortcut(s) Here from the pop-up menu.
- **Add a Shortcut to a Folder** Right-click on one or more files, and choose Copy. Then point to an empty space in the new folder, right-click, and choose Paste Shortcut.
- **Put a Shortcut Inside an E-mail Message** Just create the shortcut in a folder and drag it into your new message window.

Note: Shortcuts can come from anywhere, not just your hard drive. If you've found a location on The Microsoft Network that you like, you can create a shortcut to that location and put it on your desktop. You can also drag a file (or folder) from a shared folder on another networked computer (or file server), and make a shortcut out of it. Don't worry—Windows can keep track of where everything came from.

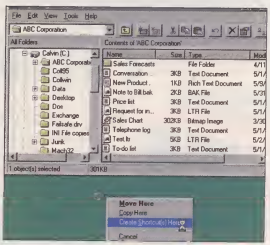
Save Time and Steps with Shortcuts

All your programs should be available in the cascading menus that pop out from the Start menu. But for programs you use every day, that click-wait-click-wait-click-routine can get pretty annoying. For those programs, why not create shortcuts at the top of the Start menu?

Add an Icon to the Start Menu Putting your favorite icon at the top of the Start menu couldn't be easier. Just open the folder that contains the file you want to add, drag the icon out of the folder, and drop it right smack on top of the Start button. If you drag WordPad from the Accessories folder onto the Start button, for example, it creates an instant shortcut that shows up at the top of the Start menu.

My Start Menu Is a Mess Over time, as you add new pieces of software to your system, the Programs section of your Start menu will start to get cluttered. It seems like every program insists on creating its own folder, even if it's only going to put one or two icons in it.

To cut through the clutter, put the programs you use every day at the top of your Start menu, while putting others you use regularly a click away inside the Programs folder. Finally, reorganize all those folders into a smaller number of folders, consolidating and renaming where appropriate. (I've put all my CD-ROM icons into a single folder, for example.) It's easy enough: Just right-click on the Taskbar, choose Properties, and then



A True Shortcut: Use the right mouse-button to drag a file out of its folder and onto the desktop as a shortcut.

Continued on page 268

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Continued from page 264



Better Start: To add items to the Start menu, right-drag an icon and drop it on the Start button.

click on the Start Menu Programs tab.

• Click on the Add button to call up a special version of the Create Shortcut Wizard that automatically adds a new entry to the Start menu's Programs list.

• Click on the Remove button to bring up a special box that lets you instantly zap a shortcut or folder from anywhere in the Start menu's Programs list.

• Click on the Advanced button to call up a special version of the Windows Explorer that lets you manage all the folders and icons in the Programs area of the Start menu.

Working with Folders

• To see folders inside of other folders, click on the plus sign to the left of any icon in the left pane.

• Click on any folder name in the left pane, and you'll see its contents in the right pane, just as if you had opened a folder window.

• To rename a shortcut or a folder, click on its name in the right pane and start typing. To delete an object, highlight the entry and press Delete.

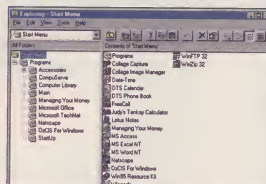
How Can I Get This Program Off the Start Menu? The Start Menu is just another folder that's found inside the Windows folder. To delete a shortcut, right-click on the Start button and choose Open. Rename, move, and delete icons in the Start Menu folder window just as you would in any other folder. An easier way, though, is to right-click on the Taskbar, choose Properties, and then click on the Start Menu Programs tab. The Remove button gets rid of unwanted shortcuts without any fuss.

Organize Your Start Menu to Make It Efficient

Now that you know how the Programs folder on the Start menu works, what should you do with it? Try these organizational strategies.

Top Five Programs on Top The Windows setup program puts all your programs into folders that you can access by clicking on the Programs choice in the start menu (see screen at left). For the programs you use every day, why go through that extra clicking? Pick the five programs you use most often, and drop them onto the Start menu to put them closer at hand. Why five? Well, OK, maybe six or seven, but any more than that and the top of the Start menu will run out of room at the top of the screen (unless you've set your display to run at a higher resolution).

Reorganize the Rest of My Shortcuts in the Programs Menu Consolidate all those little groups into a handful of folders. Take the programs you use once a week and move them straight into the Programs folder; that way they're only one cascading menu away instead of two.



Hand-Eye Coordination: To move an icon, make sure it's visible in the right pane and the target folder is visible in the left one.

Tip: Use lots of shortcuts. There's no law that says you can only have one shortcut for any program or document. If you have a favorite program, scatter shortcuts wherever you might want to get to it.

Put a Favorite Places Folder on the Start Menu Do you constantly find yourself going to the same places and doing the same things? I have a few folders that fit that definition, so I've created a special folder filled with shortcuts for each of them. To create your own Favorite Places folder, open the Start Menu folder (it's inside the Windows folder) and right-click on any empty space. Choose New, Folder, and immediately type in the folder name you want to use. Now, open a folder window for drive C: and right-drag the folder icons you use most often into the new folder. Choose the Create Shortcut(s) Here option, and you're done.

Make My Start Menu a Little Leaner For some reason, Windows 95 insists on using big, clunky icons on the Start menu. That's fine until you start adding your own entries. Oops, we're bumping into the top of the screen. To streamline the Start menu, open the Taskbar Properties dialog box, and put a check mark in the box labeled Show Small Icons In Start Menu.

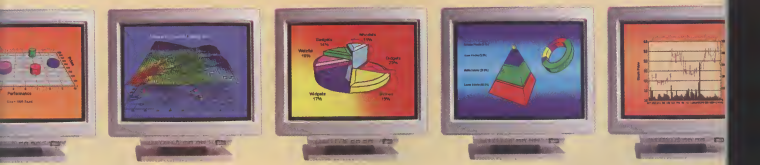
Working Directly With Documents

The most natural way to get work done with your PC is just to open a document and start typing. After all, the alternative—starting up a program—is a little like choosing a frying pan and then deciding what to cook. If you constantly find yourself working with the same documents, Windows 95 gives you plenty of ways to pick up where you left off.

I Just Worked with That Document Yesterday! Whenever you create a new document or open one you saved previously, Windows 95 adds an entry to its built-in document-tracking list. To open one of the 15 documents you've used most recently, just click on the Start button and choose Documents. A list of names like the one in will cascade out from the Start menu.

Continued on page 272

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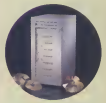
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Circle 385 on reader service card.

Continued from page 268



Space Aware: If you run out of screen space with the large icons on the Start menu, switch to small icons.

Tip: You know you worked with a file this morning, but it's not on the Documents menu. What did you do wrong? Nothing, probably. Windows can only keep track of files that are opened from a folder window, from the Explorer, or from a program that was designed for Windows 95. If you use the File menu to open or save a document with an older Windows application, it won't be added to the Documents menu.

The Documents menu doesn't go on forever, of course. There's a limit of 15. After you've filled the list, Windows kicks out the oldest entry to make room for any new ones.

Tip: To clear the Documents menu, open the Taskbar Properties dialog box, and click on the Start Menu Programs tab. In the bottom half of the dialog box that pops up, a section is devoted to the Documents menu. Click on the Clear button to empty the list and start with a clean slate.

Cooking Up New Documents from Scratch Some people like to whip up an angel food cake without Betty Crocker's help. And when it comes to computers, some people like to create new files without any help from application programs. If that's your style, Windows has a feature you'll love. As long as Windows knows how to create the file type you're looking for, a new document is just a few clicks away. All you have to do is use the New button in any folder—or even on the desktop.

Let's say you're talking with your best client on the phone. You've gotten past the pleasantries, and now it's time to get down to business, which means you need to take some notes. Right-click on any empty spot on the desktop, choose New, then WordPad Document. Windows instantly adds a new icon to your desktop, with the (boring) default name, New WordPad Document.

Just start typing to give the new document a new name; it's already highlighted for you. Press Enter to make the new name permanent. Press Enter again (or double-click) to start WordPad and load the new document. Now you can enter your notes.

When you're finished, save the document just as you normally would. You can leave it on the desktop if you like, or you can move it to another folder by using the right-click shortcut menus and the cut and paste commands.

Making the Taskbar Mind Its Manners

If you are learning to right-mouse-button click on everything in Windows, you've probably already discovered that there are a pack of options for the Taskbar as well. That's right—because it is just another Windows object, the Taskbar has properties that you can inspect (and change) with a quick click of the mouse.

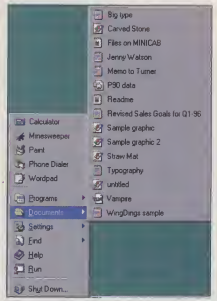
Here's a sample of what you can do:

Hide It, If I Want Some people, especially those with smaller monitors, don't like having the Taskbar take up any space at all at the bottom of the screen. If that's you, no problem—right-click on the Taskbar, choose Properties, and check the Auto Hide box. From now on, the Taskbar will turn to a thin gray line at the edge of the screen whenever you have any windows open.

To make the Taskbar pop up again, just slide your mouse pointer to the edge of the screen where the Taskbar normally appears. (That's usually the bottom, but if you've moved the Taskbar to another side, as we'll talk about in a few pages, you'll have to adjust accordingly.) As soon as the mouse pointer bumps the edge of the screen, the Taskbar will pop up.



Brave New Word(Pad): Right-click on the desktop and click on New to create a WordPad document.



Easy Return: To resume working with one of the documents on this list, just click on its choice on the menu.

Make It Bigger, If I Prefer The Taskbar is usually tall enough to hold one row of buttons—no more, no less. But if you regularly open lots of windows and don't mind losing a chunk of the screen, you can make it taller:

- Aim the mouse pointer at the top of the Taskbar until it turns into a two-headed arrow.
- Grab the edge of the Taskbar and drag it up. You can keep dragging until the Taskbar takes over half the screen, but you'll probably be better off with two rows.

Tip: Your Taskbar disappeared, and the Auto Hide option isn't checked. Where did it go? You might have accidentally dragged the Taskbar down instead of up, so that it's set to be zero buttons high. To put it back to normal, aim the mouse pointer at

Continued on page 276

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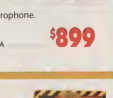
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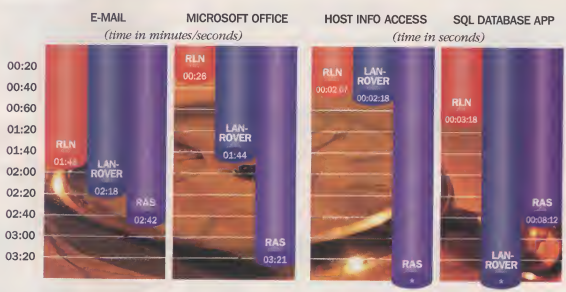


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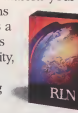
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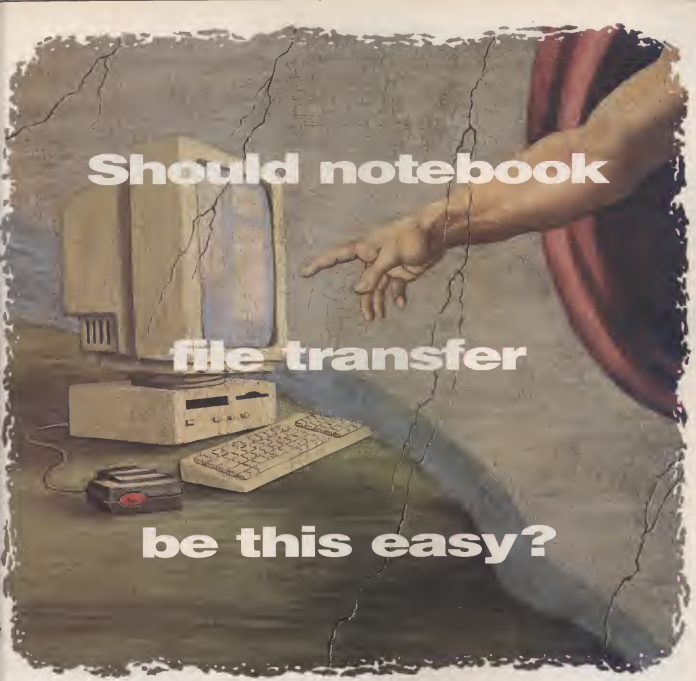
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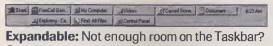
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Continued from page 272

the very bottom of the screen (or to the side where you've moved the Taskbar) until it turns to a two-headed arrow, then drag the pointer up slightly. The Taskbar will pop back into position.

Move It, If You Want To The Taskbar is sticky—it fastens itself to the bottom of the screen like a refrigerator magnet. If you don't like it at the bottom of the screen, though, you can stick it to any of the four edges of the screen. Just aim the mouse pointer at any empty spot on the Taskbar, click, then drag it up to the top of the screen and watch it fasten itself there.

There are actually good reasons to leave the Taskbar on the bottom of the screen. When it's positioned on either side, it's nearly impossible to read the labels on the buttons. And when it's fastened to the top edge, its menus end up where I expect my other programs' pull-down menus to be. But it's your computer, and if you want your Taskbar somewhere else, that's your privilege.



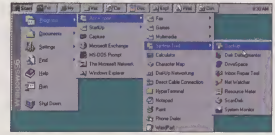
Expandable: Not enough room on the Taskbar? Grab its upper edge and drag upward to enlarge it. You can drag till it takes over half the screen.

Tip: Some older Windows programs don't communicate well with the Taskbar. The result? Part of a crucial screen or dialog box may be hidden behind the Taskbar. If you use an application that displays this behavior, try hiding the Taskbar so it stays out of your way.

Give Your Desktop a Makeover

Windows puts a few things on the desktop, whether you want them there or not: My Computer, the Recycle Bin, The Microsoft Network, and the Network Neighborhood. You can't get them off the desktop, even with dynamite. But that still leaves plenty of room on the desktop for the things you use every day. When they're on the desktop, you can get to them with a click or two. (See "To Get There Fast, Take a Shortcut," page 278.)

Just try to count how many times you click the mouse button every day. A few hundred? Easily. If you keep up with that pace, (which isn't all that frantic, really), your mouse fingers will click more than 50,000 times a year. Whew! Interested in a few finger-saving shortcuts? One unbeatable way to let your fingers do a little resting is to put a few strategically selected shortcuts on the desktop.



Macintosh-Like: So you don't like the Taskbar positioned at the bottom of the screen? Simply drag it to the top (or sides).

Drop a Drive on the Desktop On my desktop I have shortcuts that take me straight to two hard drives, a floppy drive, a CD-ROM drive, and a hard drive on another computer across the network. To copy a file, I drop it on the floppy drive icon. I can also poke around on any hard drive without having to detour through the My Computer folder.

It's easy to add these shortcuts to your desktop. Just open the My Computer window and drag one or more drive icons onto the desktop. Windows 95 will protest. "You cannot copy or move this item to this location," it will say. "Do you want to create a shortcut to the item instead?" Yep, that's exactly what you want to do. Say yes, and all you need to do is rearrange the icons to your liking.

Put a Printer Icon There, Too Maybe you need this, maybe you don't. If your print jobs go halfway across the building to a popular networked printer, it's a must-have. With a shortcut to that printer on the desktop, you're never more than a double-click away from checking your place in the laser-printer line.

I Want Shortcuts to My Favorite Programs There are a few programs that I use every single day, without exception. For these greatest hits, I want instant access, regardless of where I happen to click. I've created shortcuts to my top three programs so that I can launch them with a double-click.

I Want Shortcuts to My Favorite Folders, for That Matter I don't know about you, but I tend to store most of my stuff in a few, special places, and they're not all that easy to get to. My Letters folder, for example, is buried five folders beneath My Computer. I don't want to move those files, but I do want to get to them without ten mouse-clicks. The solution? I right-dragged the icon for the Letters folder onto the desktop and told Windows 95 to create a shortcut. Now when I want to look through Letters, I just double-click.

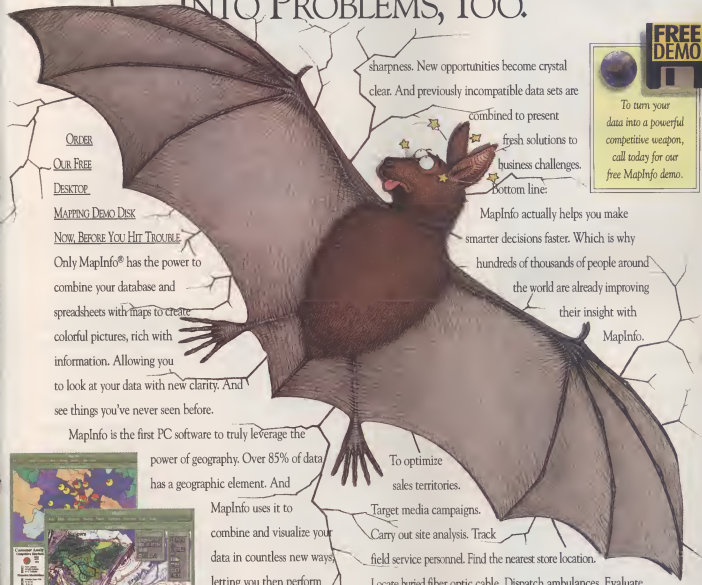
I Want a New Folder with My Favorite Shortcuts At any given time, I might be juggling work for three different clients. The files for all these projects are scattered on every corner of my hard drive. There's no need to move them around, though. Instead, I create a separate folder for each client, put it on the desktop, and fill it with shortcuts to the files I want to access when I'm working on a project for that client. I can have multiple shortcuts to the same document, too, which is a useful way to make sure I can always get to the master copy of documents I share across projects.

Here's a simple illustration of how you can use this technique to save time and energy. Let's say you have two clients whose happiness is Job One on your job description. You have letters, memos, and e-mail about their business stored all over your hard disk. Your company also keeps an online price list stored on a network file server so everyone in the company can get to it quickly.

To make sure you don't lose track of any details, create a folder for each client right on the desktop. Then, make sure your price list is handy, no matter which folder you're using. Here's how:

1. Find an empty space on the desktop, right-click, then choose New, Folder. Give the folder a name, and repeat the process for the second client.
2. Drag shortcuts for all your letters and memos into these folders, or move the

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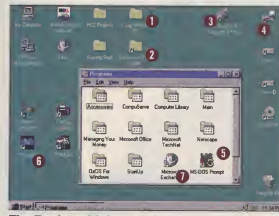
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FYI TO GET THERE FAST, TAKE A **SHORTCUT**



The Desktop Makeover: You might not want to clutter your desktop with all these shortcuts, but a few are certain to fit comfortably into your working style. Remember: The idea is to organize the Desktop in a way that'll give you fast access to your programs. How you do it is up to you.

1. This is a **folder** stored directly on the desktop. Open by double-clicking.

2. This is a **shortcut** to a folder stored somewhere else. Open it by double-clicking, too.

3. Put a **printer shortcut** here, then print files by dropping them right onto the printer icon.

4. Drag a drive icon out of the **My Computer** window for instant access to files.

5. Keep the **Programs** folder open if you prefer easy-to-read, big icons to the Start button's cascading menu.

6. Drop **shortcuts** to your favorite programs here.

7. The **arrow in the corner** of the icon tells you this is a shortcut, not the real thing.

documents themselves here.

3. Open the Network Neighborhood, and find the price list on the file server. Select the icon, right-click on it, then choose Copy.

4. Switch back to one of the folders on the desktop, right-click on an empty space, and choose Paste Shortcut. Repeat for the second folder. Now, no matter where you're working, you'll never be more than a couple of clicks from that all-important document.

Keep the Programs Folder Open Do you hate the cascading menus that fly out of the Start menu every time you click on Programs? Do you miss the Windows Program Manager? Then you might appreciate this shortcut. It doesn't look or act exactly like the old Program Manager, but the large icons and labels are easier to see than those tiny ones on the Start menu. With the Programs folder open on the desktop, you can always get to it with one click on the Taskbar.

Give Your Folders a New Look

When you first open up a folder, you get great, big icons with nice, readable labels. My Computer, for example, starts out this way. The default view is fine most of the time, but there are specific instances when you'll want to change the look of one or more folders.

The secret to quickly changing views is to turn on the toolbar in your folder window. Choose View, Toolbar, then look for the set of four buttons at the far-right edge of the toolbar. (You can also accomplish the same end by using the pull-down View menu.)

I Want to See More Icons in Each Window Try the Small Icons view or the List view. They're nearly identical; the only difference is that the Small Icon view arranges everything in rows, from left to right, while the List view arranges things in columns, from top to bottom. Who thinks of these things?

I Want to See as Much Information as Possible Then you'll want to use the Details view. The advantage here is that you can quickly sort a list by clicking on the label at the top of the column.

Tip: In the Details view, you can sort by date or size with a single click. All you do is click on the word *Modified* to sort by date. Click on Size to reorder the files by size–from smallest to biggest.

I Want Those Big Icons Back Large icons are easier to see, and their labels are easier to read, too. For windows where you don't have a lot of objects, the Large Icons view is just fine.



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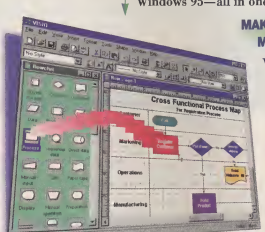
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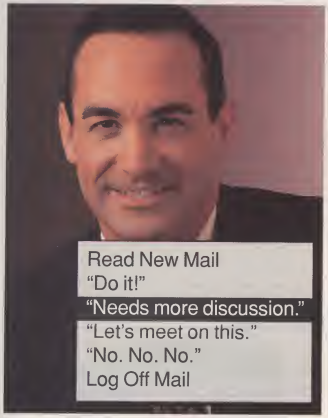
Visio 4.0's new Custom Properties feature allows you to add data behind your shapes. So, for example, in process flows you can see how efficient process paths are at a glance. And, because Visio works with the programs you work in, you can export the data to Excel for further analyzing. **Visio 4.0 also comes with a 60-day money-back guarantee. So you have nothing to lose. To order Visio 4.0 for just $149—or upgrade for $79—contact your local reseller or call 800-24-VISIO ext. C32 today. Since you get Visio for both Windows 3.1 and Windows 95, it's the smartest move you can make.**



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Richard and his favorite pop-up menu.



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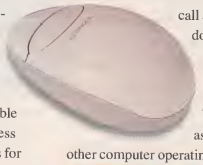
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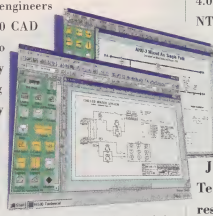


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UPGRADING FROM WINDOWS 3.*x* TO WINDOWS 95

Movin' on Up

Are you a seasoned Windows 3.1 or Windows for Workgroups 3.11 user ready to take the plunge to Windows 95? In this chapter Ed Bott goes over the new features in Microsoft's new operating system to help make your transition as painless as possible. Though you'll have to learn some things anew (or "unlearn" what you already know), many aspects of Windows 95 will be very familiar and comfortable. —*Editor*

Windows 95 is different, inside and out, from the Windows you've become used to. If you found it frustrating to work with files and programs in your old version of Windows, you're not alone. That's why, when Microsoft set out to design a brand-new Windows, the developers asked regular people to work with Windows, and watched as they struggled to do even simple tasks.

Then they took those lessons to heart and designed a computer operating system that should be easier to use than anything you've ever seen before.

What's New in Windows 95?

Well, Windows 95 is bigger—much bigger—than its predecessor. But it's also more consistent.

There are fewer layers of management in Windows 95. All those middle managers—Program Manager, File Manager, and Print Manager—got pink slips the day Microsoft retired Windows 3.1.

It's a better-looking operating system, if that matters. It's faster, too. (That *does* matter.)

You can forget about DOS and most of its confusing old rules. You don't have to worry about keeping track of complex directory paths anymore, for example, because Windows 95 replaces those directories with folders that open into windows with a double-click.

Eventually, you'll have a whole new class of application programs to choose from as software manufacturers begin to make Windows 95 versions of their programs, although for now you'll probably keep using many of your old programs.

A slick technology called Plug and Play will make it easier to upgrade your computer or add new equipment, should you decide that that makes sense.

In short, if you've been using Windows 3.1 for any length of time, you should expect this new Windows to make life easier and help you become more productive.

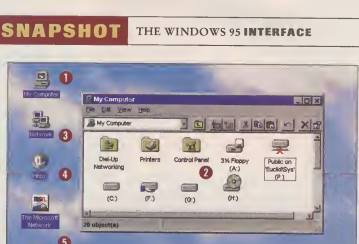
This section isn't intended to be a complete set of instructions for Windows 95. Instead, the idea is to introduce Windows 95 and show you how it's different from the Windows you already know how to use.

Windows 95 is big and complicated with a wealth of new features, but it's also extremely consistent.

How does it all work? I'm glad you asked. . . .

Sign In Here If you're used to staring at a C:\ prompt and typing WIN to start Windows, it's time to learn a new daily routine. When you flip the big red

SNAPSHOT THE WINDOWS 95 INTERFACE



1. Open up **My Computer** to see all the files, folders, and disk drives on your system.

2. Everything in Windows 95 is an **icon**, and groups of related icons are stored in folders.

3. Look in the **Network Neighborhood** for other computers and printers that you can share.

4. Double-click on the **Inbox** to open Microsoft Exchange. If you have an e-mail account or a fax modem, all your messages will come here.

5. **The Microsoft Network** is an online service that lets you explore the world.

6. When you delete a file, it doesn't go away. Windows 95 saves it in the **Recycle Bin**, from where you can easily reclaim it.

7. Use the **Taskbar** to switch between other running applications.

Continued on page 288

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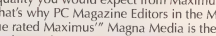


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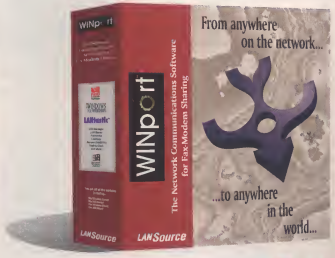
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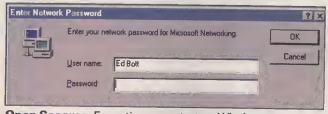
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Continued from page 284



Open Sesame: Every time you start up Windows 95 you have to log in. The dialog box you see may look a little different, depending on your network configuration.

switch each morning, Windows 95 bypasses DOS completely. The only thing you'll have to type is your password. Windows 95 expects you to log on each time you start up; if you're hooked to a LAN, you can connect to everything with a single log in.

If you aren't connected to a network and you want to avoid messing with logging in, the first time you're asked to choose a password, just press Enter. (Don't enter a password at all.) From then on, when you start Windows 95, it'll just start—it won't ask you for a password. If you've already chosen a password, you can get rid of it using the Passwords icon in the Control Panel. Open the Passwords window and change your password to nothing (no spaces, no letters—nothing).

Tip: If you're on a Novell NetWare network, you may see a different log-in box, including a box where you can enter the name of your log-in server. If you have no networking installed at all, you can bypass the log-in screen completely by clicking on the Cancel button.

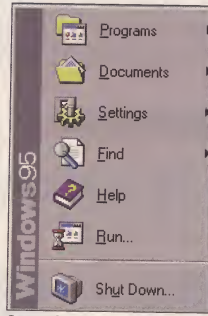
What Does the Start Button Do?

When you initially start Windows 95, your first question will probably be, "What happened to Program Manager?" (Don't worry—we'll get to that in a second.) Your second question will probably be, "What happens when I click on the Start button?"

There are only seven options on the Start menu, but it's hard to think of a thing you can't do when you click here. Think of the Start menu as Windows 95's central business district. From here, every side road leads to another interesting destination packed with surprises.

A guided tour of the Start Menu:

- **Programs** The Programs menu replaces Windows 3.1's Program Manager. Click here, and your program groups cascade off in a series of new menus that open to the right.
- **Documents** Windows 95 remembers the documents you've opened recently. To pick up where you left off yesterday, just look on this menu.
- **Settings** If something in Windows 95



Square One: The Start menu. You can get nearly anywhere from here, although it may take a few clicks....

isn't working exactly the way you'd like, click on the Settings menu to twiddle knobs and dials until you have it right. The Control Panel is here, as are any printers you have access to.

- **Find** Can't track down that file? Even if you don't remember the name, the new Find menu can help you narrow your search. All you have to know is a stray fact or two about the file. (If you're positive it contained the word *asparagus*, for example, and you know you saved it last April, you'll find it in seconds.)
- **Help** Need some Help? The built-in Windows 95 instruction book lets you find step-by-step instructions and explanations for every common task.
- **Run** The Run dialog box lets you type in the name of a program or a folder to open it instantly. Handy for the mouse-phobic.
- **Shut Down** Don't push the big, red switch to turn off your PC. Use Shut Down to make sure all your data is safe.

Teach Your Old Mouse New Tricks

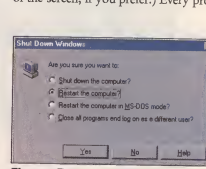
If you've used Windows for any length of time, you already know how to use the mouse. With this version of Windows, you'll find yourself using the mouse even more for quick tasks and shortcuts.

- Selecting a group of files is easier. When you need to select a bunch of things, use the mouse to throw an imaginary lasso around everything you need.
- You probably never used the right mouse-button in Windows 3.1, but it gets a full aerobic workout in Windows 95. Whenever you're not sure what to do next, point to an unfamiliar object and right-click to pop up shortcut menus.
- Dragging and dropping is the preferred way to get work done. Drag files from one folder to another to move or copy them, and drop file icons on top of a printer icon to put them on paper with the least amount of fuss. If you use the right mouse-button to drag an icon around, you'll get another kind of shortcut menu.

Switch Programs with the Taskbar

Attention, couch potatoes. If you can switch channels with your television's remote control, you can also switch between all the Windows 95 programs you have running at any given time.

The Taskbar stays anchored at the bottom of the desktop, where it's always visible. (But you can drag it to any edge of the screen, if you prefer.) Every pro-



Elegant Retreat: Don't just turn the computer off. To save settings, use the Shut Down option in the Start menu.

Continued on page 292



Windows 95

Your current hard drive

Make sure your hard drive measures up.

Seagate drives offer the capacity and performance you need to optimize Windows 95.



With the big splash being made about Windows 95, don't forget one important thing. When you upgrade, make sure you and your PC don't get swamped. Step up to a big, fast Seagate disc drive now.

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The two of us, changing the world – just like old times, Bill.

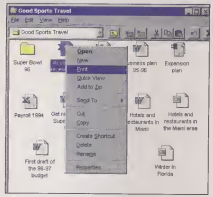


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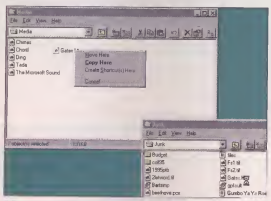
Continued from page 288



More Options: Use the right mouse-button to drag an icon—you get more options than with the left button.

gram that's currently running, and every folder that's open, gets its own button on the Taskbar.

With Windows 3.1, you had to clear windows out of the way before you could find the one you were looking for, and you were never quite sure where all those windows were hidden when you needed them most. With Windows 95, it doesn't matter how many windows you have open: Look for the window's name on the Taskbar, click on the button, and watch as the window jumps onto the top of the stack.



More Options: Not sure what's going to happen when you drag an icon from here to there? Use the right mouse-button.

Tip: If you learned to switch between applications using the keyboard shortcut Alt-Tab, you'll be happy to know it works in Windows 95, too. When you have more than one program running (or several folders open), hold down the Alt key and keep holding it down as you Tab from one program to the next. When you find the one you're looking for, release both keys to switch to that window.

The more windows you open, the more crowded the Taskbar becomes, and the less of each name you see there. To overcome this, you can increase the Taskbar's height by dragging its top edge upward.

Don't overlook one of the Taskbar's coolest features of all. At the far right, just to the left of the clock, you'll occasionally see a tiny status icon for part of your system: a printer, a modem, perhaps the volume control on your sound card. Right-click on any of these icons and you'll usually be surprised by the results. Use the volume control to turn off your multimedia speakers instantly, for example, before someone in the next room begins complaining about the racket.

Windows 95 Building Blocks If you've used Windows 3.1 for any length of time, you've learned that *icons* are small pictures you click on to start a program. You've also learned that you can arrange icons into groups within Program Manager. In Windows 3.1, you won't find icons anywhere else, and you can't put one group inside another to keep your desktop tidy.

Windows 95 is completely different. For starters, everything is an icon. Every file, every program, every printer, every computer on your company's LAN. To keep all those files neatly organized, Windows arranges them into *folders*. You can organize your data files the same way, even creating new folders inside folders. When you've learned how to work with one icon and one folder, you've mastered the most essential Windows 95 skill of all.

What's Inside that Icon? In Windows 3.1, you can learn a few basic facts about a file by looking at it: the name, when it was created, how big it is, that sort of thing. Windows 95 lets you do the same thing (and a whole lot more) with *Properties sheets*. When you point to any icon and click the right mouse button, a fact-packed box pops up.

One of the most useful choices on the right-mouse-button menu is the Quick Viewer. When you see Quick View on the shortcut menu of a document, you can ask Windows 95 to show you the document itself, even if you don't have a copy of the program that created it. (The Quick View utility is available only on the CD version of Windows 95.)

Why Is There an Arrow in the Corner of Some Icons? Let's say one of your favorite programs is buried in a folder inside a folder, which is inside another folder inside three more folders. Every time you want to start that program, you double-click so many times you're thinking of applying for an index-finger transplant. To make things easier, you could move the program to a more convenient location, but that's not very good file management. It's also not necessary. The better solution is to create a *shortcut* to the program and put it right on your desktop.

Shortcuts are tremendously useful things, and they're everywhere in Windows 95. To get a feeling for the way a shortcut works, think of how you might organize a library for maximum efficiency. Would you file the new John Grisham novel in the fiction section? With the law books? Or in the action-adventure aisle? If you were willing to pay for three copies, you could put one in each section, but that would be wasteful. Instead, you could keep one copy in the fiction section, and place a note in the other sections telling patrons to ask a clerk to bring them Grisham's latest.

When you put a shortcut on your desktop, it looks just like the original, except for a small arrow in the lower-left corner. But it's actually only a pointer to another icon, and no matter how big



Quick Switch: To go to another app, use the Alt-Tab task switcher or click on its button on the Taskbar.

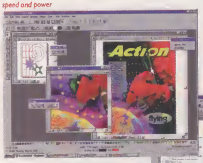
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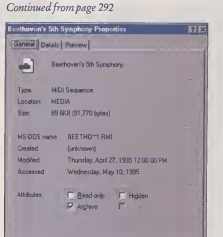
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Continued from page 292



ID Card: The Properties menu brings up a sheet of information about the objects you've pointed to.

the original file is, a shortcut occupies only a tiny piece of your hard disk. When you double-click on the shortcut, Windows 95 goes searching for the original (the *target* is the official name) and calls it up, just as though you'd clicked on the original.

Folders There's nothing complicated about folders. Just as you use manila folders to keep related pieces of paper together, you use Windows 95 folders to keep related icons together. Folders always act the same, although you can take your choice of four different ways to view the icons inside.

Tip: If you're used to File Manager, you'll like the Details view best. With this arrangement of icons, you can click on the column headings to sort by the values in that column. Click again to sort in reverse order.

Closing and Resizing Windows It's OK to keep lots of windows open, especially given how easy it is to switch between windows using the Taskbar. But you will occasionally want to clear windows out of the way or close them completely. With Windows 3.1, closing a window is a big hassle. With Windows 95, it's a snap to shrink a window to an icon, expand it to its full size, or shut it down completely. All the necessary buttons are located at the right side of the title bar, including the new Close button—the one that looks like an *X*.

Where Did My Applications Go? Will They Still Run? When you upgrade your old copy of Windows 3.1 to Windows 95, your old Windows programs should keep working just as they always did. (There are a few exceptions, such as utility programs intended to make your hard disk run faster, but most people shouldn't have to worry about them.)

Your older programs will probably work, but that doesn't mean they'll behave exactly the same as new Windows 95 programs. In fact, if you don't recognize the difference between old Windows programs and new ones, you might run into problems. Here's what to watch out for:

What's the Difference Between New Windows Programs and the Old Ones? If you pay close attention, you'll notice subtle differences in the way Windows 95 programs look. Dialog boxes, for example, are likely to have tabbed pages on them, just like the ones in Windows itself.

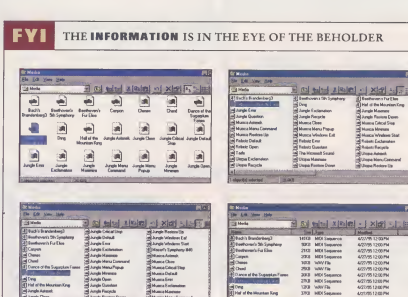
Not only do they look different, but these new Windows programs also act different than their predecessors.

Long Filenames When you open or save a file using a new Windows 95 program like WordPad (the word processor that comes with Windows 95), you can enter a long filename that helps you (or anyone else) see at a glance exactly what's inside the file. Older Windows programs don't know how to read those long filenames; they're still stuck with the old DOS filename rules. With these old programs, your filename has to be eight characters or fewer, not counting an optional three-letter extension tacked onto the end.

What happens if you've created a file with a long name and then open it with an older program that doesn't speak that language? If your long filename was a WordPad document called Letter to my accountant, 8-24-95, the old program will chop off all but the first six characters of the name, and then tack on two extra characters of its own, making the name LETTER~1.DOC. Not very informative, is it?

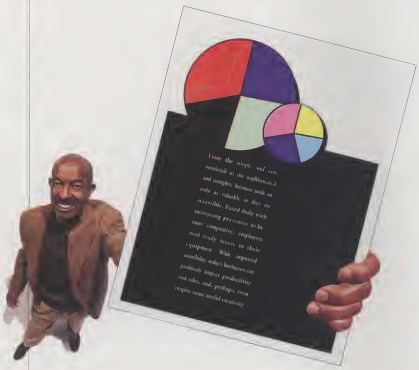
Why did the old program add the DOC extension to the end of the filename? Actually, it was there all along, but Windows 95 hides those extensions when it knows what type of file you're working with. Because it knows that files ending in DOC can be opened with WordPad, it simply shows you the name. If you want to see the extensions, just select View, then Options from My Computer or Windows Explorer, click on the View tab, and then deselect the check box marked Hide MS-DOS File Extensions For File Types That Are Registered.

FYI THE **INFORMATION** IS IN THE EYE OF THE BEHOLDER



One Folder, Four Views: Anytime you see a window filled with icons, you can have your choice of four icon arrangements. The toolbar is optional, but it's highly recommended. Select View, then Options to activate it.

Continued on page 302



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And it does it much faster than other (uh-hmmm) uninstallers, so you don't have to twiddle your thumbs for hours every time you uninstall something, archive it or go searching for leftover bits of unwanted files.



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To see for yourself everything CleanSweep 95 can do, call 1-800-683-6696 for your free trial edition. Or you can download a copy from our website at www.qdeck.com.

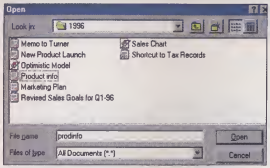
Even better, pick up the real thing at your computer store. You'll get ten dollars off just for bringing in any old uninstaller.* Don't worry, we'll find a good home for it.

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*Special competitive upgrade offer applies to registered users of Microhelp Uninstaller, Vertisoft Remove-It!, Landmark Uninstall-It, IMSI WinIdelete, and, of course, Quarterdeck CleanSweep. Dealer prices may vary.

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Continued from page 296



Great Dialogs: The new File Open and File Save dialog boxes let you create, rename, or delete folders on the fly.

New and Improved Dialog Boxes Every time you open or save a file with a new Windows 95 program, you'll use a slick dialog box that's pretty consistent across all Windows 95 applications. When one of these dialog boxes is open, you can do all sorts of useful things with the icons inside it.

- To add a new folder, right-click and choose New, Folder.
- To delete a file, right-click on its icon and choose Delete.
- To give a file a different name (perhaps so you can save your new file under that name instead), select the file and then click on its name and start typing.

In short, anything you can do in a folder window or with the Windows Explorer (the File Manager replacement, which we'll get to shortly), you can do in one of these dialog boxes.

More Drag-and-Drop Options Windows 95 programs typically let you drag and drop icons in much more flexible ways than older programs do. They also take better advantage of shortcuts, which means you can create an e-mail message, drag the shortcut to a Microsoft Network forum into it, and send it to someone else (using the same system), and he or she will be able to open it.

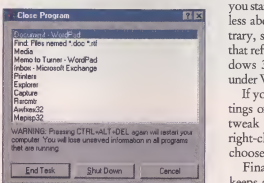
Extra Crash Protection Windows 95 programs are a little more crash-resistant than older programs. With either type of program, though, if a bug causes your computer to lock up, you can recover by pressing Ctrl-Alt-Del, then looking in the list for a program that has stopped responding, and shutting it down without harming the rest of your open programs and data files.

Installing (and Uninstalling) Windows 95 Programs New Windows 95 programs should be easier to install—and easier to remove later if you decide you don't need them anymore. To take care of either task, open the Control Panel and double-click on the Add/Remove Programs icon.

What About My DOS Programs? Windows 95 doesn't go through MS-DOS (the old Microsoft operating system) when you start it, but that doesn't mean it's clueless about DOS programs. On the contrary, some of your old DOS programs that refused to run gracefully under Windows 3.1 may actually perform better under Windows 95.

If you know how to fine-tune the settings of an old DOS program, you can tweak it under Windows 95, too. Just right-click on the program's icon, then choose Properties.

Finally, if your old DOS program keeps giving you fits, try running it in MS-DOS mode. Click on the Start button and choose Shut Down from the Start menu, then check the button next to Restart The Computer In MS-DOS Mode, and click on OK. You won't be able to run other programs while your DOS program is running, but at least you'll be able to get your work done.



I Dare Ya: Press Ctrl-Alt-Del. You'll get a list of running programs so you can remove an ill-behaved one.

Finding Familiar Tools

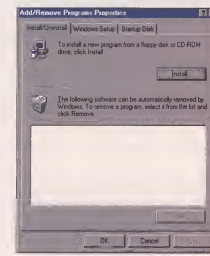
All those middle managers you learned how to deal with in Windows 3.1 are gone in Windows 95. There's no more Program Manager, no File Manager, no Print Manager. The jobs they used to do are now handled by other parts of Windows 95: the Start button replaced Program Manager, and the Windows Explorer replaced File Manager. (There's still a Print Manager of sorts, although it's not called that anymore—it's just a window with the printer's name.)

What Happened to Program Manager? Click on the Start button to pop up the Start menu, and then rest the mouse pointer on the Programs choice. After a second or so, a new menu will cascade off to the right.

That's where all your Program Manager groups went.

When you install a new program, instead of creating a Program Manager group, it will create a new folder containing shortcuts for all the new files it wants you to know about, then arrange the new folder on one of the cascading menus.

Unlike Program Manager, you can rearrange these folders so that you have groups inside of groups. That makes it easier to stay organized. (The easy way to do it: Right-click on the Start button. Remember: When you're not sure what to do next, point and right-click.) I used to have 40 program groups fighting for space in my Program Manager window, and too often it was impossible to find anything. With Windows 95, I created a folder called Extras and filled it with all the folders for programs I rarely use. Now, when



Easy Software Upgrades: The Add/Remove Programs icon in Control Panel installs and uninstalls programs.

Continued on page 306

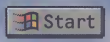
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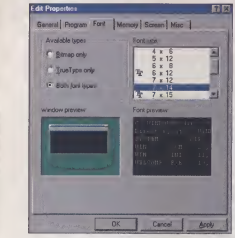
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Continued from page 302



DOS Is Alive and Well: Do you miss the old CA prompt? It's still here—get to it from the Start menu, Programs.

I call up the Start menu and click on Programs, I see a short, easy-to-follow list of the programs I use all the time.

Where's File Manager? You probably learned how to use the Windows 3.1 File Manager, but I'll bet you never learned to like it. Besides, with those silly eight-character filenames, what could you really do with it?

When Microsoft finished Windows 95, File Manager got a gold watch, a hearty handshake, and a one-way ticket to the retirement home. Now, when you want to move, copy, delete, or rename files in Windows 95, you have a lot of choices.

Explorer: Seeing Everything at Once

The Windows Explorer is about the closest thing to the old Windows 3.1 File Manager that Windows 95 offers. To start it, click on the Start button, choose Programs, and look for Windows Explorer on the first cascading menu.

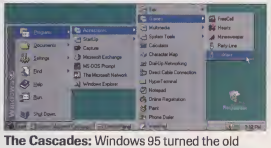
What Do I See When I Look at an Explorer Screen? You can scroll up and down through a tree-style listing on the left of your display that includes everything on your computer and any networks you're attached to. Click on the plus signs to see more detail; click on the minus signs to put all that confusing detail away.

Windows 95 displays the contents of the folder (or other object) that's currently selected in the tree pane on the right of the display. As you choose new items on the left, the display on the right changes to match. You can drag any object out of the right-hand pane and drop it on an icon in the left pane, or onto the desktop—or, for that matter, anywhere you want to. You can right-click on any object in either pane to see its Properties.

Just as with a folder window, you can change the view of items in the right pane to Large Icons, Small Icons, List, or Details.

Folder Windows, One at a Time Folder windows work just like the right pane of the Windows Explorer. If you find the Explorer view confusing, this arrangement might be easier to work with. To open a folder window, double-click on My Computer, and then just keep double-clicking.

Find Files or Folders Windows 95 includes an amazingly powerful way to track down any object anywhere on your PC, even across a network. All you need to know is a little bit of information about the thing you're looking for.



The Cascades: Windows 95 turned the old Program Manager sideways and rearranged your groups. Click here to start up any program.

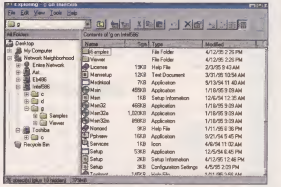
When you choose Find from the Start menu, you'll pop up a dialog box. Enter a part of the name if you know it. If you don't know that much, try clicking on the Advanced tab and entering a word or phrase that you're sure is in the file you're looking for. You can also tell Windows 95 you want it to restrict its search to files in a certain location (like your Windows folder) or to files created in a certain time period, such as during the month of August 1995.

Is There Still a Control Panel? Yes, there is still a Control Panel, and it still looks a lot like its Windows 3.1 counterpart. As a cursory glance at the Control Panel icons shows, you can adjust anything on, in, or around your computer with a few clicks here.

How Do I Add New Hardware? Every so often, someone calls me and asks if they should buy a multimedia upgrade kit. If they're using Windows 3.1, I recommend against it in the interest of preserving their sanity. The old Windows forced you to think like a rocket scientist to add even the simplest hardware. But if you're using Windows 95, go ahead and tackle that multimedia upgrade. The worst that can happen is you'll be bored, because Windows 95 takes care of most of the work.

The secret of Windows 95's hardware success is twofold. The first ingredient in the equation is some fancy technology called Plug and Play. Basically, every time you turn on your PC, Windows 95 looks at everything inside your PC and compares it against what was there the last time it ran its census. If there's a new device hanging around—like a sound card or CD-ROM drive—it may ask you to insert your original Windows disks, but that's the extent of your involvement.

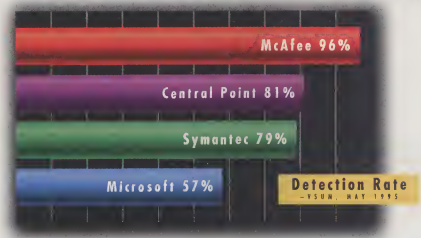
To make life even easier for Windows 95, you can use the Add New Hard-



System at Your Fingertips: Explorer replaces Windows 3.1's File Manager. And it's not just that. It's a window to your entire system.

Continued on page 310

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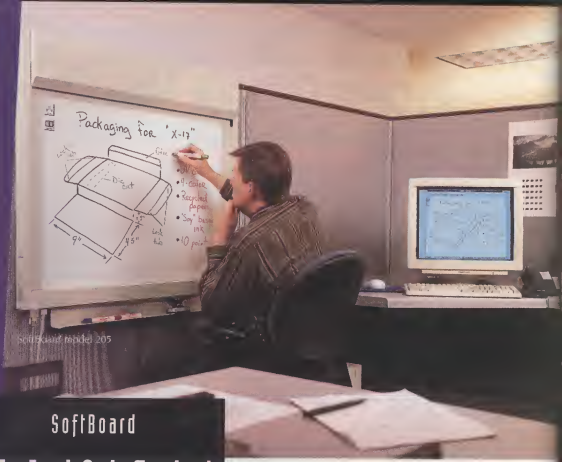
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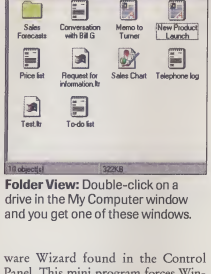
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Runs on Windows 95

Continued from page 306



Folder View: Double-click on a drive in the My Computer window and you get one of these windows.

ware Wizard found in the Control Panel. This mini program forces Windows 95 to search for new hardware on your PC; it also lets you choose the name of the hardware from a lengthy list of more than 1,000 devices.

How do you know what kind of hardware is installed in your PC? If you guessed that it would involve the right mouse-button, go to the head of the class. Find the My Computer icon, right-click on it, and choose Properties from the pop-up menu. You'll see a detailed System Properties display. Click on the Device Manager tab to see all your hardware—up close and personal.

How Do I Set Up a Printer? As far as Windows 95 is concerned, a new printer is just another piece of hardware, so it uses its Plug and Play smarts to automatically detect as many printers as it can. If you add a new printer to your work area, click on the Start button and choose Settings and then Printers to open the Printers folder. You can click on the blank printer page to add a new printer from the list included with Windows 95; after you're done, Windows 95 volunteers to print a test page to make sure everything's working. Great idea.

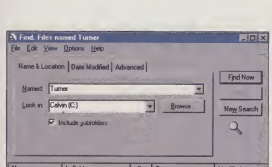
Once the printer is installed, it gets its own icon in the Printers folder, and you can check the status of the printer and any jobs simply by double-clicking on it.

How Do I Add New Fonts? Adding a new font under Windows 3.1 is complicated. But under Windows 95, all you have to do is open the Fonts folder in the Control Panel, then choose File and Install New Font from the pull-down menus. Once the fonts are in place, you can use the same folder to print font samples or to sort your fonts into groups of typefaces that resemble one another.

How Do I Change the Look and Feel of Windows 95? Maybe you changed your Windows 3.1 wallpaper into something flashy or fun. Maybe you even added a screen saver. But there's no comparison with the sheer number of things you can do to make your system look and feel different with the help of Windows 95.

When you right-click on any empty spot on the desktop and choose Properties, Windows 95 pops up the Display Properties dialog box.

- Screen savers keep snoops from reading whatever you're working on if they walk by when you're not around.
- Wallpaper lets you place an image on the desktop.
- You can switch *resolution* —the number of objects you can see on the screen at one time—and *color depth*—the number of simultaneous colors you can see. Some of the changes don't require you to even restart Windows 95, in dramatic contrast to the way these things worked under older versions.
- If you don't like the colors, fonts, and size of everything on the desktop, you can change it in Display Properties by clicking on the Appearance tag.



Anything, Anywhere: Choose Find from the Start menu and you can find nearly any file on your hard disk or any computer on your network.

Where Do I Go for Help? Stumped? There's an impressive set of instructions available right on the Start menu. Click on Help, then select the Find tab to search for a word. You might just find the answer you're looking for.

What About Those Little Programs? Some of the old, familiar, Windows 3.1 accessories are gone. If you'd like, we can now observe a moment of silence for the Calendar, the Windows Anti-Virus program, and the Cardfile list manager. (If you upgraded over the top of Windows 3.1, some of those programs may still be hanging around, but there aren't new versions of them.)

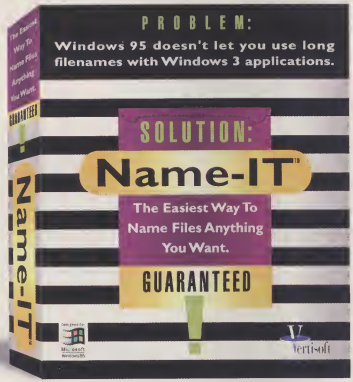


Tweak Here: The new Control Panel lets you pop the hood on Windows and fiddle with your computer's innards.

But Windows 95 includes enough new and genuinely useful programs and accessories that you'll probably forgive Microsoft for dropping those old programs. These accessories include:

- WordPad, a simple word-processing program.
- Paint, which lets you indulge your artistic tendencies.
- Phone Dialer, which dials and tracks phone calls for you.
- File Transfer, which works with certain modems to let you send a file while you are talking to the recipient on the phone.
- HyperTerminal, a basic communications package.
- CD Player, which lets you blast rock and roll (or Bach) from your CD-ROM drive and multimedia speakers.
- Volume Control, which keeps the neighbors from getting upset about the rock-and-roll part.

Continued on page 314

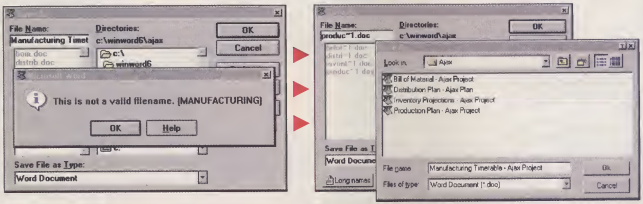


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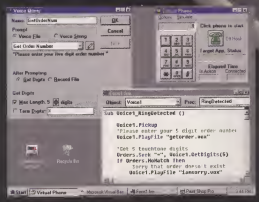
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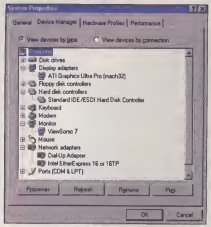
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Continued from page 310



Nuts and Bolts: To view hardware, right-click on My Computer, choose Properties and then Device Manager.

• A handful of system tools, including Disk Defragmenter, ScanDisk, and DriveSpace, which help you get the most out of your hard drive.

• A Backup program that helps you copy important files to a safe place.

Connecting to the Outside World

No computer is an island. When you feel like sharing anything, from files to ideas, here's where to turn.

Networking If you have a network adapter in your computer, you can easily share files and printers with others. To see what's out there, look in the Network Neighborhood for any other computers or file servers that might be available.

Sharing takes a slight extra step, but it's not difficult. Just right-click on a drive icon in My Computer. If you've installed File Sharing services for your network, the option will be on the pop-up shortcut menu.

The hardest part, although it's a little easier than it used to be, is setting up your network in the first place. Look in Control Panel for the Network icon. If you know a networking expert, offer him or her a case of Jolt cola or a box of chocolate HoHos to come do the work for you.

E-mail and Faxes Once the network is up and running, take advantage of it by using Windows 95's built-in mail program. It's called Microsoft Exchange, and its claim to fame is that all your messages, including faxes people send to your fax modem, arrive in a single place where you should have no trouble managing them.

The Microsoft Network Even if your company doesn't have a network, you can hook up with the outside world by joining The Microsoft Network. It's not for everyone, and it's not free, but it's one sure way to see how the rest of the world lives.

I Want to Take Windows 95 on the Road. . . . Windows 95 has a lot to offer for notebook users.

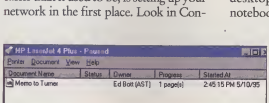
• If battery life is an issue, look in the Control Panel (and at the right of the Taskbar) for power-management gizmos.

• If your notebook uses a docking station when you're in the office, the Plug and Play support can help you switch effortlessly between docked and undocked modes. You just slip the notebook in and out of its dock as though it were a videotape.

• You can print a job—even at 35,000 feet and miles away from the nearest printer. Just tell Windows 95 that you want it to store the print job on your hard disk until you get back into the office.

• If you don't have a docking station, the next best thing is a Direct Cable Connection, where you can shuffle files and print jobs back and forth between your desktop and notebook PCs.

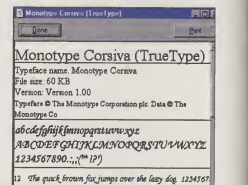
• To keep track of those files, use the Briefcase. When you drag files from your desktop PC into a Briefcase on your notebook, Windows 95 keeps track of both sets of files. The next time you hook the two computers together, it looks on both lists and makes a note of the differences it sees. Then it offers to update the older files with the newer ones. If you've ever struggled to keep two computers in sync, you'll wonder how you ever lived without this feature.



Where's That Memo? Double-click on the printer icon on your Taskbar (if you have one) to get a list of pending print jobs.

I'm Missing One of the Pieces of Windows 95 When you install Windows 95, it asks you to pick from a list of preset installation choices, then makes some intelligent guesses about which programs you might want to use. Most of those guesses will be right, but sooner or later you'll come across a program you want to use that didn't make it onto your PC.

As long as you have the original disks you used to install Windows 95, it's no problem to update your setup after the fact. Just open Control Panel and choose Add/Remove Programs, then click on the tab headed Windows Setup.



So That's What It Looks Like: Check the Fonts folder for a detailed look at every font installed on your computer.

• To add a component, check the entire box in the scrolling list.

• To remove a component, clear the check mark from its box.

• To choose specific parts of each section, highlight the entry in the list and then click on the button labeled Details.

Caution: Tired of a program? Don't try to remove files or directories yourself; you're likely to leave orphaned files behind, or even create serious problems in other programs that rely on files from that folder. If the program is a native Windows 95 app, use the Add/Remove Programs tool in Control Panel to uninstall it. If it's an old Windows 3.*x* program, look for an uninstall program designed for 16-bit apps under Windows 95.

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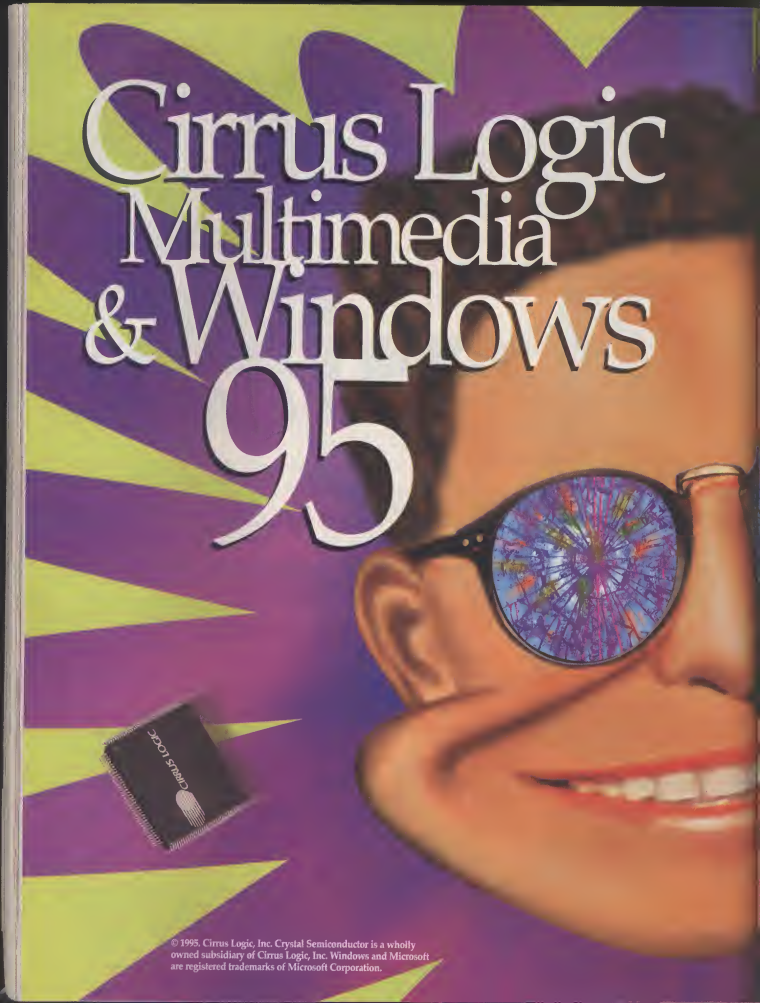
Dell's featured digital artist is Sanjay Kothari of New York, NY.

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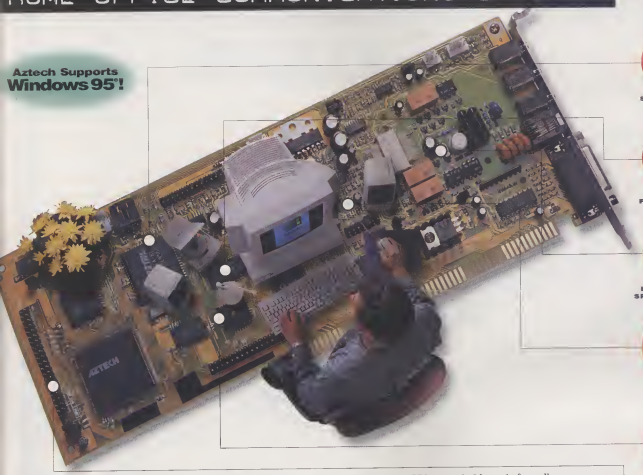
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Communications

With Windows 95, PC-based communications are easier than ever. If you use Windows 95 applications, you don't need to configure the modem separately for each program because the operating system maintains that information centrally. And the telephony applications programming interface (TAPI) manages all your communications applications so they work side by side, comfortably. Want to find out more? The following excerpts from the *Windows 95 Resource Kit* ($49.95, Microsoft Press) introduce communications with Windows and troubleshooting hardware and software problems. **YL**

What's New?

The new Windows communications subsystem allows applications to transmit data quickly and reliably, and to cooperatively share communications devices. The new kernel and communications architecture in Windows provide the following benefits:

Improvements over Windows 3.1 Windows 95 replaces the monolithic communications driver architecture of Windows 3.1 with a modular driver model that allows other software and communications device manufacturers to easily plug in new communications device drivers.

High-Speed Reliability Windows supports reliable, high-speed communications. It avoids loss of characters by keeping up with data coming in from the communications port. To speed up communications, the amount of code in the kernel that can be used by only one process at a time (critical sections) has been reduced. In addition, the network architecture and 32-bit, protected-mode file system of the communications subsystem reduce required mode transitions and interrupt latency. The data transmission speed in Windows is limited only by the hardware characteristics of the computer, such as processor speed and communications port type.

Windows 95 supports communications devices with higher transmission speeds than base RS-232 devices. For example, it supports Integrated Services Digital Network (ISDN), which can communicate at speeds of 64 or 128 kilobits per second, if an ISDN vendor provides a driver.

Higher Data Throughput The 32-bit communications subsystem takes advantage of the preemptive multitasking architecture of Windows 95 to provide better responsiveness to communications applications, thus supporting higher data throughput. Consequently, communications transfers in Win32 applications are not as affected by other tasks running in the system as Win16-based applications under Windows 3.1 were.

Support for Plug and Play and Legacy Communications Devices Plug and Play support and device installation wizards simplify installation and configuration of Plug and Play and legacy modems and communications devices.

Device Sharing TAPI arbitrates among applications that want to share the same communications ports and devices. For example, while Dial-Up Networking waits for an incoming call, Microsoft Fax can send an outgoing fax without the user having to close Dial-Up Networking.

Communications Architecture

Windows 3.1 used a monolithic communications driver, COMM.DRV, that provided an API so Windows-based apps could interact with communications devices and the code that served as the communications port driver. This approach made it necessary to completely replace the Windows communications driver if new functionality was required by a hardware device.

Windows 95 provides a more flexible communications architecture by separating communications operations into three primary areas: Win32 communications APIs and TAPI, the universal modem driver, and communications port drivers.

VCOMM is a new communications device driver that provides the protected-mode services that allow Windows-based applications and drivers to use ports and modems. To conserve system resources, communications drivers are loaded into memory only when in use by applications. Also, VCOMM uses the new Plug and Play services in Windows 95 to assist with configuration and installation of communications devices. The following list describes the primary areas that make up the architecture:

Win32 Communications APIs and TAPI The Win32 communications APIs in Windows 95 provide an interface for using modems and communications devices in a device-independent fashion. Applications call the Win32 communications APIs to configure modems and perform data I/O through them. Via TAPI, applications can control modems or other telephony devices.

Universal Modem Driver The universal modem driver (Unimodem) is a layer that provides services for data and fax modems and voice so that users and application developers will not have to learn or maintain difficult modem AT commands to dial, answer, and configure modems. Rather, Unimodem does these tasks automatically using minidrivers written by modem hardware vendors. Unimodem is both a VCOMM device driver and a TAPI service provider. Other service providers can also be used with TAPI, for example, those supporting other devices, such as an ISDN adapter, a telephone on a PBX system, or an AT-command modem.

Port Drivers Port drivers are specifically responsible for communicating with I/O ports, which are accessed through the VCOMM driver. Port drivers provide a

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layered approach to device communications. For example, Windows 95 provides a port driver to communicate with serial communications and parallel ports, and other vendors can provide port drivers to communicate with their own hardware adapters, such as multiport communications adapters. With the port driver model in Windows 95, it is not necessary for vendors to replace the communications subsystem as they did in Windows 3.1.

Windows Telephony API TAPI-aware communications applications no longer need to provide their own modem support list because interaction with a modem is now centralized by Windows 95. All communications services provided with Windows 95 use these services.

TAPI provides a standard way for communications applications to control telephony functions for data, fax, and voice calls. TAPI manages all signaling between a computer and a telephone network, including basic functions such as dialing, answering, and hanging up a call. It also includes supplementary functions, such as hold, transfer, conference, and call park found in PBX, ISDN, and other phone systems. TAPI also provides access to features specific to certain service providers, with built-in extensibility to accommodate future telephony features and networks as they become available.

The TAPI services arbitrate requests from communications applications to share communications ports and devices in a cooperative manner. Win32-based applications can use TAPI functionality to make outgoing calls while others are waiting for incoming calls. Of course, only one call can be performed at a time, but users no longer have to close applications that are using the same communications port.

TAPI consists of two interfaces: an API that developers use to write applications, and the service provider interface (SPI) that applications use to establish the connection to the specific telephone network. This model resembles the computer industry model for printers in that printer manufacturers provide printer drivers for Windows-based applications.

Modems and Communications Tools

Windows 95 simplifies modem use by allowing you to install and configure a modem once to work for all communications applications, just as you do for a printer. This provides the following benefits:

- Centralized modem and COM port configuration through the Modems option in Control Panel for all communications applications created for Windows 95.
- Support for hundreds of brand-name modems, including automatic detection of them.
- Modem connections and configuration using point-and-click options instead of AT commands.

> **Note:** For applications created for Windows 3.1 or MS-DOS, you still need to define the serial port, modem type, and other modem settings within each application.

Windows 95 includes three tools for expanding communications capabilities:

- *HyperTerminal:* Lets you connect two computers through a modem and TAPI for transferring files. It also automatically detects data bits, stop bits, and parity.
- *Phone Dialer:* Allows you to use a computer to dial phone numbers for voice telephone calls. It includes a telephone keypad, user-programmable speed dials, and a call log.
- *Microsoft File Transfer:* Enables you to send and receive files while talking on the phone.

With Windows 95, you can also do the following:

- Set up a modem in the Modems option in Control Panel, or in a communications application created for Windows 95 (such as HyperTerminal) when you run it for the first time. Windows 95 provides an Install New Modem wizard that automatically detects the modem type and sets its default settings.
- Send and receive faxes via a modem using Microsoft Fax.
- Configure HyperTerminal to predefine computers to which your computer can connect.
- Configure Phone Dialer to make voice telephone calls.
- Define the location from which you are calling only once in Dialing Properties. All communications tools and applications created for Windows 95 will reference that location when dialing out.
- Manually dial a phone call or display a terminal window before or after dialing. For information, see "Setting Modem Properties."
- Connect to a remote computer using Dial-Up Networking. For information, see "Dial-Up Networking and Mobile Computing."

Installing a Modem

Before you install and configure a modem for use with Windows 95, you should decide the following:

- How many users need modems installed on their computers, and what are the locations to which and from which they will be calling?
- What kind of security restrictions do you want to apply to modems installed on individual computers, as described in Security?
- What properties do you need to set for making connections, as described in Setting Modem Properties?

> **Note:** In Windows 95, you cannot share a modem installed on another computer on the network. You can, however, share a fax modem over the network. For information, see "Microsoft Fax."

You can install a new modem in one of three ways: use the Modems option in Control Panel; run a communications application, which causes Windows 95 to prompt you to install a modem; or add a modem through the Add New Hardware option in Control Panel.

In all cases, the Install New Modem Wizard appears and asks if you want Windows 95 to automatically detect the modem or if you want to manually select a modem from the list of known manufacturers and models. If you choose the detection option, the wizard detects and then queries the modem to configure it. If it cannot detect the modem, it prompts you to select one.

When the modem has been selected, you can, if necessary, adjust its properties, such as the volume for the modem speaker, the time to wait for the remote computer to answer the call, and the maximum speed to use.

Depending on the type of modem, installing and configuring it might vary slightly as follows:

Continued on page 328

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• If you install an internal legacy (non–Plug and Play) modem adapter, its built-in COM port must be configured with the Add New Hardware Wizard before it is installed by using the Modems option in Control Panel. In most cases, the Install New Modem Wizard does this automatically. However, on some computers, you might also need to run the Add New Hardware Wizard.

• If you are using Windows 95 PCMCIA drivers, then Windows 95 will detect and configure PCMCIA modem cards automatically when they are first inserted. Otherwise, you might need to run the Add New Hardware Wizard in Control Panel to configure the card's built-in COM port. Then, you should install the PCMCIA modem card using the Modems option in Control Panel. For more information, see "Devices."

> **Note:** Before you install a modem, check the Modems section in the Windows 95 README.TXT for possible information.

To install a modem using the Modems option in Control Panel:

1. In Control Panel, double-click on the Modems icon.
2. If no modem is currently installed on your computer, the Install New Modem Wizard starts automatically to lead you through the steps for installing a modem. Follow the online instructions. *Or:* If you are installing a second modem, click on Add to start the Install New Modem Wizard.

In most cases, it's best to let the Install New Modem Wizard detect the modem for you. If it cannot detect the exact manufacturer and model, the wizard picks a standard configuration that is usually compatible. Your modem will still function at its maximum speed and according to factory default settings. A few advanced features—such as enabling and disabling compression, error control, and flow control—might be disabled.

For information about installing a modem if your modem is not detected or listed, or about finding a better match than the standard modem, see "Troubleshooting Communications Problems."

Windows 95 automatically assigns COM names to communications ports, internal modem adapters, and PCMCIA modem cards according to their base I/O port addresses as described in "Devices."

Setting Modem Properties

In the Modems option in Control Panel, you can globally change default modem settings for all communications applications and tools created for Windows 95. For example, if you do not want to listen to the modem speaker, you can turn it off for all tools and applications that use that modem. Alternatively, you can adjust these settings within each application.

> **Note:** For Windows 3.1 or MS-DOS–based applications, you need to configure the modem settings within each application.

To view general properties for a modem, follow these steps:

1. In the Modems option in Control Panel, click on a modem, and then click on the Properties button.
2. In General Properties, view the default settings for the modem that will be used by all applications created for Windows 95.

Port A port is either a COM or LPT port to which an external modem is attached, or a COM port name that identifies an internal or PCMCIA modem. Windows 95 automatically assigns a port name (COM1, COM2, COM3, or COM4) to any device it detects. Usually, the name is adjusted only if you move an external modem from one COM port to another. For PCMCIA modem cards, the port cannot be changed.

Speaker Volume This adjustment sets the volume for the telephone speaker, which broadcasts the dial tone, modem connection, and voices, if applicable, on the other end. To change the volume, move the slider bar.

Maximum Speed This is the speed at which Windows 95 communicates with the modem. It is limited by the CPU speed of the computer and the speed supported by the communications port. Windows 95 selects a conservative default speed so that slower computers do not lose data during transfers. Set the speed lower if the default rate causes data errors. Set it higher for faster performance if you are using a computer with a 486 or Pentium processor. For example, 57,600 might work better than the Windows 95 default setting of 38,400 for V.32bis (14,400-bps) modems on fast computers. If applications report data errors, then set a lower speed (for example, change it from 38,400 to 19,200 for V.32bis modems).

> **Tip:** If you have a slower, older computer and an external modem, you can purchase and install a 16550A universal asynchronous receiver/transmitter (UART)-based COM port adapter to increase speeds. Some internal modems have an integrated 16550A UART adapter.

To change or view the connection properties, click on the Connection tab in General properties to display the connection options for your modem.

Connection Preferences Connection settings usually correspond to what the computer on the other end is using. Do not change connection settings using the Modems option in Control Panel. Use a specific tool or application, such as HyperTerminal, to change these settings on a connection-by-connection basis.

Wait for Dial Clear this option if you are making calls from a country other than where your modem was purchased and your modem fails to properly detect the dial tone.

Cancel the Call Change the number of seconds listed in this field if, for some reason, it takes a long time to make a connection. For example, this might occur when you are making an international call and there are long delays before the call is connected.

Disconnect a Call Change the number of minutes listed in this option if, for some reason, there is no activity on the line. For example, increase the number if you want to stay connected to a computer bulletin board even though there is no activity.

You can also specify settings for data bits, parity, and stop bits in Connection Properties. For information about these values, see online Help.

To view or change advanced connection properties, click on the Advanced button in the Connection Properties dialog box to display the Advanced

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Connection Settings dialog box. In this box you can set error control, flow control, and modulation, as well as audit the modem operations.

Use Error Control Check this option to boost file transfer speeds by eliminating errors caused by noise on the telephone line. This feature is available on most newer modems. When this feature is enabled, modems sometimes have trouble connecting. If this occurs, clear the check box and try again.

Required to Connect Check this option if you want your modem to connect with another modem only if error control is enabled on a call. This is useful in areas with very noisy phone lines. In these cases, connecting at a slower speed can improve data throughput.

Compress Data Check this option to boost transmission speeds by compressing data between the modems. This feature is available on most modems. When this feature is enabled, modems sometimes have trouble connecting. If this occurs, clear the check box and try again. Using modem compression can sometimes reduce performance if the data being sent is already compressed by the application.

Use Cellular Protocol Check this option when you want your modem to use special protocols that are designed to reduce errors over cellular connections. You might want to clear this option when making a call on a normal noncellular telephone line.

Use Flow Control Check this option for all external modems to avoid data loss. If your modem cable has RTS and CTS wires connected, you can use hardware flow control; otherwise, use software flow control.

Low-speed Modulation Check this option if you are having problems making an international call. Depending on the type of modem, Windows 95 provides three possible settings: Bell 103 and 212A, A for calls in the United States; ITU-TV V.21 and V.22 for international calls; and ITU-TV V.23 for French Minitel calls.

Extra Settings Check this field to type modem commands that Windows 95 will include in the initialization sequence that it sends to the modem before dialing. Do not include the AT prefix in this box. The Extra Settings option is intended only for debugging purposes, and should be used only by experienced modem users.

Record a Log File Check this option to record commands and responses to and from the modem in the MODEMLOG.TXT file in the Windows directory. Reading this file along with a modem manual can help you solve problems. After you identify the problem, you can adjust the appropriate modem keys in the Registry. Only advanced users should use this feature.

Dialing Manually

Windows 95 lets you manually dial your modem if you are having difficulty making an international call or other connection. To manually dial your modem, you need a separate telephone headset and keypad. You can request manual dialing, using slightly different procedures, from within any Windows 95–based communications applications, such as HyperTerminal, Dial-Up Networking, or Microsoft Fax. The following procedure describes how to manually dial your modem by using Dial-Up Networking.

To manually control modem dialing, follow these steps:

1. In Dial-Up Networking, right-click on a connection icon, and then click on Properties.
2. Click on the Configure button, and then click on the Options tab.
3. Click on the Operator Assisted or Manual Dial option, and then on OK.
4. Double-click on the connection icon in Dial-Up Networking, and then click on Connect.
5. When instructed, pick up the phone and dial the number.
6. When you hear the other computer answer, click on Connect and hang up.

Displaying the Terminal Window Before or after dialing, you can display a terminal window to type AT modem commands if a connection requires them. A terminal window can be used to log on for security purposes, to establish connections with servers that require a specific log-on procedure, and for other reasons. The following procedure describes this process for Dial-Up Networking.

To display a terminal window before or after dialing, follow these steps:

1. In Dial-Up Networking, right-click on a connection icon, and then click on Properties.
2. Click on the Configure button, and then click on the Options tab.
3. Click on the Bring Up Terminal Window Before Dialing option, or the Bring Up Terminal Window After Dialing option, and then click on OK.

Modem Registry Keys

The following section describes information stored in specific modem Registry keys that might help advanced users correct problems with the commands that Windows 95 uses to control a modem. To identify modem problems, you can enable Windows 95 to create a MODEMLOG.TXT file (as described in Setting Modem Properties), which contains responses to and from a modem when a connection was made. The MODEMLOG.TXT file might indicate when Windows 95 is sending an incorrect command string to a modem, or when a response code is not being correctly interpreted. After consulting the documentation for the modem, you might be able to adjust the modem's Registry keys to restore proper operation.

Modem Registry keys are stored under the following key:

```
Hkey_Local_Machine\System\
CurrentControlSet\Services\
Class\Modem
```

For each installed modem, Windows 95 creates one Registry key (starting with \0000); additional subkeys, which contain AT commands that Windows 95 uses to initialize, dial, and answer the modem; plus other entries that communications and modem drivers use.

Some of the more important entries that you can use to correct or optimize modem operation are described in the following sections. The full set of modem Registry keys and the INF file format are documented in the *Windows 95 Device Development Kit.*

HyperTerminal

You can use HyperTerminal with a modem to connect two computers so you can send and receive files or connect to computer bulletin boards and other information programs. For example, you can use HyperTerminal to connect to an online service and to download files from a bulletin board on the online service.

Continued on page 336

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Continued from page 332

You can also use HyperTerminal to connect a computer directly to another computer, such as a debugging terminal.

The easiest way to install HyperTerminal is to choose Custom Setup during Windows 95 installation and then select HyperTerminal when selecting components to install.

To install HyperTerminal *after* Windows 95 Setup, follow these steps:

1. In the Add/Remove Programs option in Control Panel, click on the Windows Setup tab.
2. In the Windows Setup Components list box, click on Communications, and then click on the Details button.
3. In the Communications dialog box, click on HyperTerminal, and then click on OK.

For more information, see the online Help in HyperTerminal.

Terminal Emulation Types HyperTerminal supports the following terminal emulation types: ANSI, Viewdata (for the United Kingdom), Minitel (for France), DEC VT 100, Auto Detect, VT 52, and TTY.

To choose a terminal-emulation type, right-click on a connection icon, and then click on Properties. In the connection's properties, click on the Settings tab, and then select the emulation type.

Note: Some modems might not be able to connect to French Minitel in HyperTerminal using the Windows 95 default settings. To correct this, add an extra command in the Extra Settings field in the Advanced Settings dialog box in the modem's properties. Check the modem manual for the command that enables the modem to connect in V.23 modulation to Minitel, and then add this to the Extra Settings field.

Phone Dialer

The Phone Dialer application that comes with Windows 95 lets you use a computer to make voice telephone calls using the calling-card and location information defined in Dialing Properties. It also stores frequently dialed numbers, dials stored phone numbers, and logs telephone calls.

The easiest way to install Phone Dialer is to choose Custom Setup during Windows 95 installation and go through the following procedure. You can also install it after Windows 95 installation using the Add/Remove Programs option in Control Panel.

To install Phone Dialer *after* Window 95 installation, follow these steps:

1. In the Add/Remove Programs option in Control Panel, click on the Windows Setup tab.
2. In the Windows Setup Components list box, click on Communications, and then click on the Details button.
3. In the Communications dialog box, click on Phone Dialer, and then click on OK.

To start Phone Dialer and make a call, select the Start button, point to Programs, then point to Accessories, and then click on Phone Dialer. In the Phone Dialer dialog box, type a phone number, either with your keyboard or using the Phone Dialer numeric keypad. Click on Dial.

When you dial a number with Phone Dialer, the number is automatically stored in a list of your most recently used telephone numbers. All local, domestic long-distance, or international telephone numbers are stored when you type all the digits needed to dial in the Number To Dial text box. You can also store phone numbers as speed-dial numbers.

Important: The Number To Dial text box can hold as many as 40 digits. Therefore, you can type a local, domestic long-distance, or international long-distance phone number in this text box. The same is true when you create speed-dial numbers.

If you type the area code and local telephone number, Phone Dialer automatically precedes the dialed number with a one if you have typed this information in the My Locations properties in the Dialing Properties dialog box. Dialing Properties is a separate communications tool described in "Using Dialing Properties."

If you type nonnumeric characters (such as hyphens or a parentheses) in a phone number, Phone Dialer ignores them except when you type a plus sign at the beginning of your number, which is international format. If you type a number in international format, you must put parentheses around the area code, for example, +1 (206) 882-8080. For more information, see the online Help in Phone Dialer.

According to the North America Dialing Plan (a standard set of procedures telephone companies in North America use), to make a long-distance call you must dial a one, followed by a three-digit area code, followed by a seven-digit local phone number. In a few cases local phone companies have not followed this rule and allow you to omit the initial one for certain numbers in adjacent area codes. Thus, the number you dial is 10 digits, not 11.

To dial long-distance calls without a one prefix, follow these instructions:

1. From the Tools menu in Phone Dialer, click on Dialing Properties. (For more information about this tool, see "Using Dialing Properties," below.)
2. Verify that the area code listed here is correct for your location. (Change it if necessary.) Click on OK.
3. Using any method you prefer for storing phone numbers, type the phone number as a ten-digit number, omitting the one prefix.

The Windows 95 telephony number-translation function sees the local area code in both the location and in the destination number, and assumes it should dial only the local number. For example, suppose you are dialing from area code 905 and can dial phone numbers with area code 416 without the 1 prefix. You would store those numbers as +1 (905) 416 *xxx xxxx*, where *xxx xxxx* is the local phone number.

Using Dialing Properties

Dialing Properties is a utility that has been integrated with Phone Dialer, HyperTerminal, Dial-Up Networking, and other communications applications created for Windows 95.

The options you set with Dialing Properties are stored in the TELEPHON.INI file (instead of the Registry), to ensure backward compatibility with older 16-bit Windows telephony-enabled applications.

With Dialing Properties, you can do the following: Define calling locations (including specifying area code, country code, and in-house dialing rules); and define calling-card rules.

Continued on page 340

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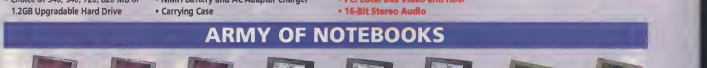
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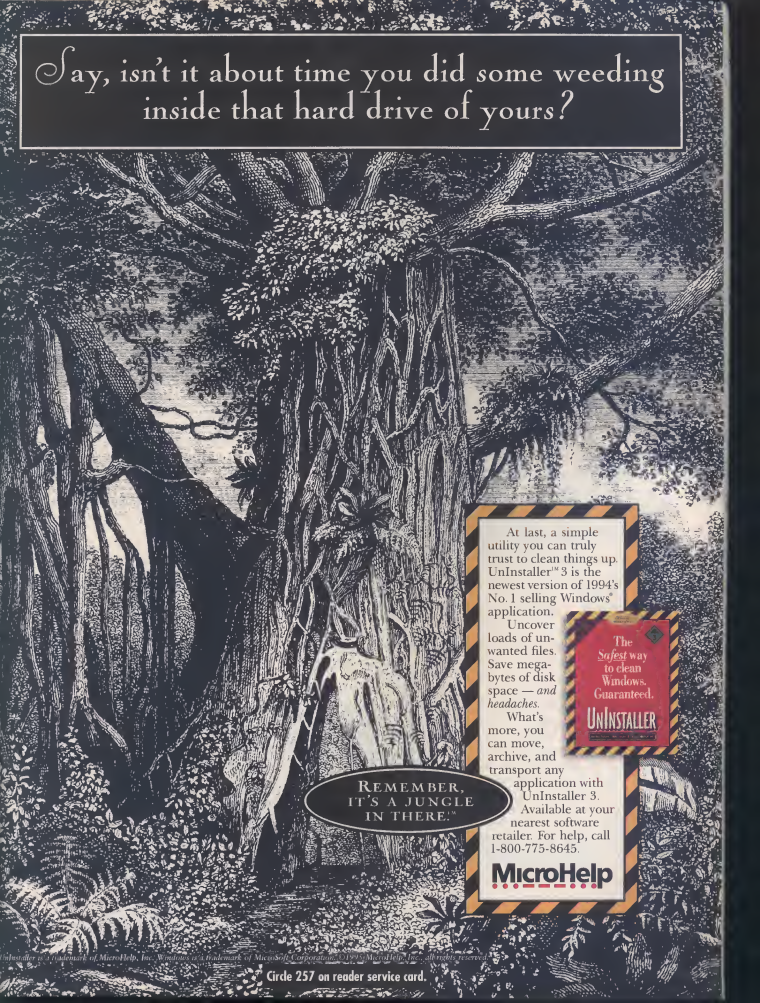
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Continued from page 336

In Windows 95, you can access Dialing Properties from the Tools menu in Phone Dialer, or by clicking on the Dialing Properties button when you make a new connection in HyperTerminal. For purposes of discussion, procedures in this section describe accessing Dialing Properties from Phone Dialer.

Define Calling Locations A *location* is information that Dialing Properties uses to analyze telephone numbers in international format and to determine the correct sequence of numbers to be dialed. It need not correspond to a particular geographic location, but it usually does. For example, a location could specify the procedures needed to dial calls from your office or from a room in a hotel. You can name locations anything you choose to help you remember and select them later. Dialing Properties lets you add new locations, edit existing locations, and remove locations you no longer need.

To define a location in Dialing Properties, follow these steps:

1. Run Phone Dialer, click on the Tools menu, and then click on Dialing Properties.
2. In the My Locations Properties, type information about where you are calling from, including the following: the name of your location (for example, home or office), area code, country, access number required to make a local or long-distance call, whether your phone line has call waiting and if it should be disabled, whether you use pulse or tone dialing, and whether you use a calling card to make calls.

If you want to change calling-card information, click on the Change button.

Define Calling Card Rules A *calling card* is information that Dialing Properties uses to create the sequence of numbers to be dialed on a particular call. The calling card can include a calling-card number that can be dialed at a specified time during call placement. However, the calling card does not have to specify a card number (in other words, calling cards can also be used to define alternative procedures for direct dialing without a calling-card number). To help you remember them, you can name calling cards anything you choose.

Dialing Properties includes predefined settings for several popular calling cards, including AT&T, Sprint, MCI, British Telecom, France Telecom Mercury, Telecom New Zealand, and others. You can modify and use these directly or copy them to create your own calling cards. Dialing Properties allows you to add new calling cards, edit existing calling cards, and remove calling cards you do not need.

The information stored in a calling card includes the name, card number, and the dialing rules for local, long-distance, and international calls.

To specify that you are using a calling card in Dialing Properties:

1. In My Locations properties click on the Dial Using Calling Card check box.
2. In the Change Calling Card dialog box, click on your calling card type in the list (for example, AT&T), and then type your calling card number. Click on OK.

You can also customize dialing rules by clicking on the Advanced button in the Change Calling Card dialog box. The following two examples illustrate how you might use dialing rules.

If you are making a calling-card phone call from outside the United States and do not want Windows telephony applications to automatically add a zero prefix to the number you are calling, precede the phone number with another numeric code, such as 144 as in the following example.

To redefine numbers that automatically precede the phone number:

1. In the Change Calling Card dialog box, click on the New button, select the name of the calling card, type the card number, and then click on the Advanced button.
2. In the Dialing Rules dialog box, complete the dialing rule fields. Insert a comma to include a fixed two-second pause; use multiple commas to increase the time. Use the following codes as appropriate.

E	Country code
F	Area code
G	Destination local number
H	Calling card number
W	Wait for a second dial tone
@	Wait for a ringing tone followed by five seconds of silence
$	Wait for a calling-card prompt tone (if your modem supports it)
?	Display an onscreen prompt to the user to continue dialing

For example, if you are using a British Telecom card, you need to precede the number you dial with 144 and complete the fields as follows:

Calls within the same area	144,H,G
Long-distance calls	144,H,0FG
International calls	144,H,00EFG

3. Click on OK, and then click on OK again. In the My Locations properties, remove the leading zero from your area code (for example, 71 or 81 in London). Click on OK.
4. Using Phone Dialer or HyperTerminal (or another tool), store your destination number in international format with only the country code (44), area code (without the leading zero), and local number (+44(71)5551212).

When you choose the Dial option from Phone Dialer or HyperTerminal, the tool you are using automatically expands this number to include 144 and the card number, plus the pause codes.

In another scenario, suppose your organization in the United States uses a PBX system and you need to omit the one prefix before the area code. Create a calling card as in the following example.

To omit the one prefix with a PBX system:

1. In the Change Calling Card dialog box, click on New.
2. In the Create New Calling Card dialog box, type a name for your calling card, such as "Direct Dial Through PBX." Click on OK.
3. In the Change Calling Card dialog box, click on Advanced.
4. In the Dialing Rules dialog box, complete the text boxes and then click on OK.

Calls within the same area	G
Long-distance calls	FG
International calls	011EFG

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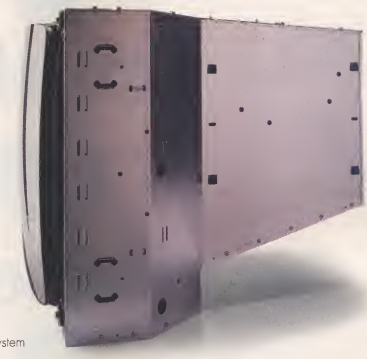
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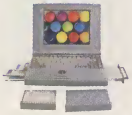
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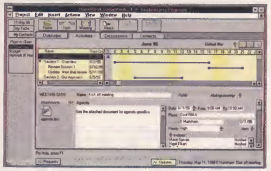


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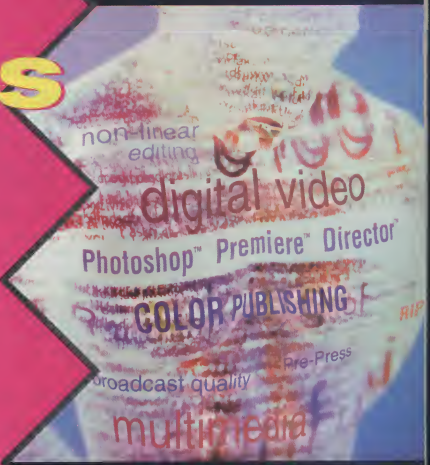
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Continued from page 340

For more information, see the online Help for Microsoft File Transfer.

File Transfer Protocols HyperTerminal supports the following file transfer protocols:

- *Xmodem:* The most common error-correcting data communications protocol. Most communications packages support Xmodem, and some support only Xmodem. This protocol is also supported by most online services. Xmodem is slower than other protocols, such as Zmodem.
- *1K Xmodem:* A variant of traditional Xmodem, which sends data in 1K (1,024-byte) blocks instead of 128-byte blocks. On some bulletin boards, this protocol is called Ymodem.
- *Ymodem:* A faster version of Xmodem, transferring data in 1K blocks.
- *Ymodem-G:* A variant of Ymodem designed for use with modems that support hardware error-control. If you cannot transfer files by using Ymodem-G, your modem might not support error control. Use Ymodem instead.
- *Zmodem:* The fastest data transfer protocol, and the primary choice of most bulletin board users. Zmodem dynamically changes its block size based on line conditions, and is extremely reliable.
- *Kermit:* An extremely flexible protocol, found most often on Digital Equipment Corp. VAX computers, IBM mainframes, and other minicomputers. However, Kermit is quite slow and should not be used if faster options are available on the other computer.

Note: You can choose a file transfer protocol to use when you send or receive a file by using the Send or Receive File options in the Transfer menu, as described in online Help.

Troubleshooting

This section describes how to solve problems with installing modems, making connections, and using applications to access a modem. Windows 95 provides a troubleshooting aid for modems in online Help. Try online Help for before trying the steps included in this section. In addition, a general modem-diagnostic tool is located in the Modems option in Control Panel. It provides information about each modem and COM port that have been configured on the computer.

To use the Modems Diagnostics Tool, follow these instructions:

1. In the Modems option in Control Panel, click on the Diagnostics tab.
2. In Diagnostics properties, click on the Driver button to find out which communications driver is installed for Win16-based communications APIs. For these applications, the driver should be COMM.DRV. If a different driver is listed and you are having problems with using Win16-based applications, the driver is probably the cause.
3. In Diagnostics properties, click on the More Info button to make sure Windows 95 can communicate with the modem. Clicking on this button causes Windows 95 to send commands to and read responses from the modem, and then to display information about the modem and its COM port.

The Port Information box displays the following information:

- The IRQ and I/O address of the modem's COM port. These should match the physical configuration of the port or modem adapter.
- The UART type of the COM port, for example, 8250 or 16550A. Notice that 16550A UART ports can sustain faster connection speeds with fewer errors.
- The highest port speed supported by the modem. Never set the modem's speed higher than the speed listed here.

The Modem Information box displays the modem's responses to various AT commands that Windows 95 previously sent to it. Some modems return a response that indicates what make and model it is. This can help you select the correct modem if the Install New Modem Wizard did not detect it correctly. Notice that many modems return "ERROR" for some AT commands. This means that the modem does not support that particular AT command.

The Record a Log File option in the Modems option also helps you identify modem problems by recording modem commands and responses in a MODEMLOG.TXT file, as described in "Setting Modem Properties."

Correcting Problems With Modem Installations

This section describes situations that can interfere with the installation of a modem, and how to fix them.

The Install New Modem Wizard Detects the Modem as a Standard Modem This does not indicate a problem. Rather, it means that Windows 95 was unable to detect the exact make and model of a modem. Most communications applications work correctly with the Standard Modem option. That is, connections can be made successfully using the modem's factory-default settings. However, advanced control of some features, such as speaker volume, error control (for example, V.42 protocol), and compression (for example, V.42bis protocol) will be disabled in the modem's properties.

If you don't want to use the Standard Modem option, you can run the Install New Modem Wizard to select a specific type of modem that is similar to the modem you are using. If you specify another, similarly named model from the same manufacturer—for example, if you configure the modem as a Practical Peripherals PM9600HC when a Practical Peripherals PM9600FX modem is actually installed—Windows 95 usually treats the models as being identical and the specified configuration will probably work well.

To determine whether other modem models are compatible with the one you are using, check the modem manual. Many modems are compatible with Hayes, Microcom, Rockwell, or U.S. Robotics models.

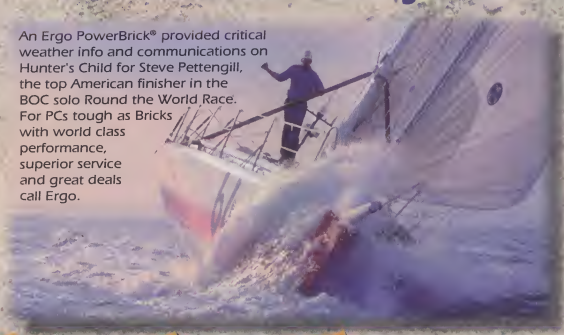
The Install New Modem Wizard Does Not Detect Any New Modems Here's a checklist of things to look for:

- Make sure the modem does not already appear in the list of installed modems. Windows 95 will not redetect modems that are already installed.
- Make sure no other programs are running that might be using the modem or its COM port.
- If the modem is external, check the connection between it and your computer, and reset it by turning it off and on again.
- If the modem is internal, make sure that its built-in COM port has been configured properly in Device Manager in the System option in Control Panel. If it does not appear, run the Add New Hardware Wizard to allow Windows 95 to detect and configure it.
- Make sure the modem's COM port is active and has a correct IRQ by checking

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its Resources configurations in Device Manager in Control Panel's System option. Make sure the IRQ does not conflict with one in use by another device. For details, see "Devices."

If the Install New Modem Wizard still does not detect a modem, then there is probably a problem with the port, the cable, or the modem itself. Try the modem with an MS-DOS–based communications program, or with another computer, if possible.

The Install New Modem Wizard Does Not Detect a PCMCIA Modem If the Windows 95 PCMCIA drivers are loaded, then Windows 95 should automatically detect and configure a PCMCIA modem when it is installed. Use the PCMCIA option in Control Panel to check the configuration of a PCMCIA socket driver.

If the Windows 95 PCMCIA drivers are not being used, then the modem card must be configured as a COM port before the Install New Modem Wizard can detect and configure it as a modem.

To detect and configure a PCMCIA modem when Windows 95 PCMCIA drivers are not used:

1. Configure the modem according to the instructions that came with your original PCMCIA driver software.
2. Run the Add New Hardware Wizard to detect and configure the card as a COM port.
3. Run the Install New Modem Wizard to detect and configure the card as a modem.

For more information about PCMCIA devices, see "Devices."

Correcting Connection Problems

This section describes basic steps for troubleshooting communications and explains specific communications errors or problems and how to correct them.

Modem Will Not Dial or Will Not Answer If your modem is not set up correctly, communications features might not function properly. The following procedures list steps in verifying the correct operation of your modem and the Windows 95 communications subsystem.

Because some communications programs designed for Windows 3.1 install incompatible driver files, which can cause COM ports and modems to stop working, start by verifying that the correct Windows 95 files are being loaded.

To verify that the required communications files are present, follow these instructions:

1. Verify file sizes and dates of COMM.DRV and SERIAL.VXD in the SYSTEM directory against the original versions from the Windows 95 floppy disks or CD.
2. Confirm that the following lines are present in SYSTEM.INI:

```
[boot]
comm.drv=comm.drv
[386enh]
device=*vcd
```

3. To revert to the default communications drivers for Windows 95, delete communications port entries in Device Manager.
4. Run the Add New Hardware Wizard in Control Panel to detect and install the Windows 95 drivers.

> **Note:** Windows 95 does not load the SERIAL.VXD driver in SYSTEM.INI. Rather, Windows 95 loads it on demand by using the Registry. Also, there is no corresponding file for the *vcd entry in SYSTEM.INI. This is an internal file built into VMM32.VXD.

To verify the modem configuration by using the Modems option in Control Panel:

1. In General Properties, verify that the manufacturer and model for your modem are correct. If not, you might have changed the modem and failed to reconfigure it. In this case, run the Install New Modem Wizard to detect the modem and confirm it with the current Registry configuration.
2. If your modem does not appear in the list of installed modems, click on Add, and then select the appropriate modem.
3. If the manufacturer and model are not correct and are not available from the list, try the Hayes-compatible option or the Generic Modem driver option, set to the maximum speed supported by the modem. Click on OK.
4. Try removing any other modem entries in the list to eliminate any conflicts.

To verify that the modem is enabled by using the System option in Control Panel:

1. Click on the Device Manager tab, click on a modem from the list, and then click on Properties.
2. Click on the option named The Device Is Present, Please Use It, if this is not already selected.

To verify that the port is correct by using the Modems option in Control Panel:

1. In General Properties, click on a modem, and then click on the Properties button.
2. In General Properties for that modem, verify that the listed port is correct. If not, select the correct port. Click on OK.

To determine if a serial port's I/O address and IRQ settings are properly defined by using the System option in Control Panel:

1. Click on the Device Manager tab, click on Ports, and then click on a specific port (such as COM2).
2. Click on the Properties button, and then click on the Resources tab to display the current resource settings (IRQ, I/O) for that port. To find the correct settings, consult the modem manual.
3. In the Resources Properties, check the Conflicting Devices List to see if the modem is using resources in conflict with other devices.
4. If the modem is in conflict with other devices, click on the Change Setting button, and then click on a basic configuration that does not cause resource conflicts.

> **Note:** Do not try to use a modem on COM3 if there is a serial mouse or other device on COM1. Usually, COM1 and COM3 ports use the same IRQ, meaning that they cannot be used simultaneously on most computers. The COM2 and COM4 ports have the same problem. If possible, change the COM3 or COM4 port to an IRQ setting that is not in conflict. Also, some display adapters (especially S3, 8514A and ATI mach8) have an address conflict with COM4 ports. You can work around this by using another COM port or replacing your display adapter.

To check the port settings by using the Modems option in Control Panel:

1. Click on a modem in the list box, and then click on Properties.

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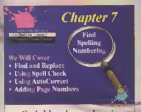
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Continued from page 350

2. Click on the Connection tab to check the current port settings, such as bits per second (speed), data bits, stop bits, and parity.
3. Click on the Advanced button to check error control and flow control. If you are using Win16-based applications, turn off these advanced features.
4. Verify the UART type.

Data transmission problems can occur if a speed greater than 9,600 bps is selected on a slower 386-based computer not equipped with a 16550 UART, or when performing other tasks during a file download. If problems or errors occur during transmission, try lowering the speed. Attempting to use speed greater than 9,600 bps on computers equipped with 8250 or 16450 UARTs will probably result in dropped characters.

To check the modem speed by using the Modems option in Control Panel:

1. Click on a modem in the list box, and click on the Properties button.
2. In General Properties, check the speed to make sure it isn't set too high for either the modem or computer. Lower speeds might work, especially when using an older, slower computer.
3. Click on the option named Only Connect At This Speed if it is not already selected.

Tip: To optimize your system's communications performance, you can set the speed higher if your computer has an 486 or Pentium processor.

To disable hardware flow-control if your modem cable doesn't support it:

1. In the Modems option in Control Panel, click on a modem in the list box, and then click on the Properties button.
2. Click on the Connection tab, and then click on the Advanced button.
3. If a check appears in the Use Flow Control check box, click on the box to clear it.

To remove virtual device drivers (VxDs) from other vendors that might be interfering with modem operation, search for and comment out (type a semicolon as the first character of the line) any related entries in the SYSTEM.INI file. When commenting out a line in SYSTEM.INI, it is useful to add a comment line noting this.

The Initialization (Dialing) String is Improper for the Modem If the modem will not pick up the line and dial, it might be due to an improper initialization string. Typically, the manufacturer's recommended dial command string is loaded from the corresponding modem INF file. However, if your modem driver was not available and you selected a compatible modem, the dial command string might not work correctly. Try using Modem Types and retest the modem dialing the selected number.

The Modem Repeatedly Drops the Connection There are several possible reasons for this problem. Here are a few suggestions:

- Check for a bad or loose serial cable to the modem. If all connections are tight, test for a faulty cable by replacing it with a working cable, and retest the modem communications.
- Check the connection between the RJ-11 phone outlet and the modem. Verify that the connection is firmly plugged in and well connected.
- Try using a different phone line. If you have ruled out other factors, consistent modem errors might be due to problems in the telephone line used for communication.
- Disable call waiting, if it's in use. The call waiting feature can interfere with remote connections and file transfers. If you use this feature regularly, disable it only temporarily (during the time the modem is in use).
- Check communications with the host computer. The communications problems might be due to the fact that the host computer not connecting or repeatedly dropping the line.
- Try using a lower speed in the Modem Properties in the Modems option in Control Panel.

The COM Ports Remain in Device Manager After the Modem is Removed After installing an internal modem and assigning it to a COM port that does not physically exist on your computer, the port appears in the Device Manager. After removing this adapter, you might also need to manually remove the port in Device Manager as described in "Devices."

You Are Unable to Dial International Calls Windows 95 allows you to set specific modem properties that assist you when making international calls over your modem. You set these properties in Dial-Up Networking, Dialing Properties, and in Modems Properties.

- *To check location and calling-card settings:* In Phone Dialer, click on Tools, and click on Dialing Properties. In the My Locations Properties, verify that your calling location and calling-card settings are correct.
- *To disable dial-tone detection if your modem fails to detect a dial tone:* Click on the Connection tab In the Modems option in Control Panel, and click on to clear the check box next to the Use Dial Tone option.
- *To increase the time between dialing if connections are taking a long time:* Click on the Connection tab In the Modems in Control Panel, and then increase the number of seconds in the Cancel the Call If Not Connected Within option.
- *To manually control modem dialing:* See "Dialing Manually."
- *To display a terminal window to type AT commands before or after dialing:* See "Displaying the Terminal Window."

Correcting Modem Problems with Applications

Problem: You cannot send or receive binary files using HyperTerminal.
Solution: Follow these steps:

1. Make sure that both computers are using the same file-transfer protocol (Xmodem, 1K Xmodem, Ymodem, Ymodem-G, Zmodem, or Kermit).
2. If you are using the Ymodem-G file transfer protocol, ensure that your modem supports hardware error control. If it doesn't, try using Ymodem instead.
3. If you are trying to use an alternative protocol such as Kermit, and you encounter transmission errors, try Xmodem instead. Most communications packages, bulletin boards, and online services support Xmodem.

Problem: You can't dial with Phone Dialer.
Solution: Refer to this checklist:

- In the Dialing Properties dialog box, make sure your area code and country code are correct.
- For each access number you want to use for calling out, specify, at a minimum, the country code, area code, and telephone number.
- Verify basic modem and port configurations.

Continued on page 362

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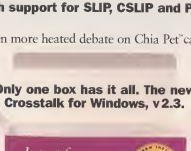
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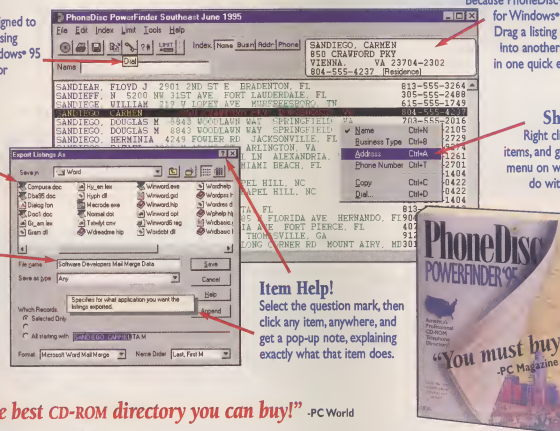
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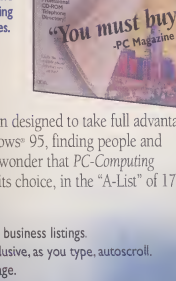
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Problem: Win16-based applications cannot access the modem, but MS-DOS–based or Windows 95–based applications can.

Solution: Make sure the communications driver for Windows 3.1-based applications is COMM.DRV in the SYSTEM.INI file. Some applications replace this driver for various reasons.

Problem: MS-DOS–based applications cannot access the modem (especially PCMCIA modems), but all Windows-based applications can.

Solution: Refer to the following checklist:

- If possible, adjust the IRQ setting in the MS-DOS–based application according to the application's documentation.
- If the MS-DOS–based application's IRQ settings cannot be adjusted, adjust the IRQ settings for the modem COM port as described earlier in this section.

Problem: MS-DOS–based and Windows 3.1-based applications cannot access the modem, but applications created for Windows 95 can.

Solution: Make sure that Microsoft Exchange Remote Mail, Microsoft Fax, and Dial-Up Networking are not waiting for incoming calls. If they are, older applications cannot access the modem.

Problem: Errors occur during MS-DOS–based applications communications sessions, especially file transfers.

Solution: Increase the COMxBuffer setting in [386Enh] section of SYSTEM.INI. The default value is 128 bytes.

E-mail and Microsoft Exchange

This chapter describes the e-mail and messaging features of Windows 95, including the Microsoft Exchange client. Exchange provides a central place for sending and receiving messages within a workgroup and to and from other messaging services, such as e-mail, faxes, and online services.

Microsoft Exchange: The Basics Windows 95 includes the Microsoft Exchange client, an advanced messaging application that retrieves messages into one in-box from many kinds of messaging service providers, including Microsoft Mail, The Microsoft Network, and Microsoft Fax. Its integration with Microsoft Fax software allows you to send rich-text documents as faxes or mail messages. Setting up Exchange to communicate with service providers is as easy as connecting to different printers in a network environment.

With the Microsoft Exchange client, you can do the following:

- Send or receive e-mail in a Windows 95 workgroup.
- Include files and objects created in other applications as part of messages.
- Use multiple fonts, font sizes and colors, and text alignments in messages.
- Create a Personal Address Book or use address books from multiple service providers.
- Create folders for storing related messages, files, and other items.
- Organize and sort messages in a variety of ways.
- Send and receive messages to and from the following service providers: Microsoft Mail; Microsoft Network (online service); Microsoft Fax; Other messaging services that use messaging API (MAPI) service providers.

The Issues Before installing and configuring e-mail on a network, you should review the following issues:

- What e-mail system will you use? Do you want to communicate with others in a workgroup, or with people on the Internet or other online services? For communicating within one workgroup, Windows 95 provides a complete Microsoft Mail Workgroup Post Office and a wizard for setting it up. For communicating among workgroups, you will need to upgrade to Microsoft Mail Server, as described in "Upgrading to the Microsoft Mail Server."
- If you use the built-in Microsoft Mail Workgroup Post Office, where will it be located, and who will administer it? The post office can reside on any computer in the workgroup. For best results, that computer should have ample hard disk space to contain message files, be accessible to users at all times, and have at least 8MB of RAM. To begin with, you should allow approximately 2MB of storage on the mail server. As the number of users and the size of stored mail messages increases, you will need to increase storage for the post office. When you have more than 20 users, consider using a dedicated computer for the workgroup's post office. Be sure to determine the location of the post office before you configure Exchange. If you choose Microsoft Mail during setup, Windows 95 runs the In-box Setup Wizard at the end of Setup, but you cannot fully configure Exchange if you have not created a post office. After Windows 95 Setup, you can configure the Microsoft Mail Workgroup Post Office by running the Microsoft Workgroup Post Office Admin Wizard in Control Panel. For information, see "Using the Exchange Client with Microsoft Mail," page 370.
- Which service providers, such as Microsoft Fax, do users need to connect to? Requirements for connecting to service providers vary depending on the type of service. For example, connecting to the Microsoft Network (MSN) requires that the user has a modem, Dial-Up Networking, a phone line, and an account from MSN. You choose the service providers you want during Setup or afterward in the Mail And Fax option in Control Panel or from within Exchange. For details, see "Setting Up the Exchange Client," page 366.
- Do you want users to connect to service providers from their individual computers or from the network? For security purposes, a network administrator might want to restrict users from communicating with other service providers from their computers. If you want users to connect to service providers through a gateway on a network server, you must purchase a gateway and an e-mail system that allows you to connect to a gateway. For example, if you are running Exchange with Microsoft Mail Workgroup Post Office, you must upgrade the workgroup post office to Microsoft Mail Server and purchase a gateway. For information, see "Upgrading to the Microsoft Mail Server," and "Microsoft Mail Gateways."
- Will users connect to the post office from a remote site? If so and you are using the Microsoft Mail Workgroup Post Office, you need to create a Dial-Up Networking connection to the post office and configure a remote access server for dial-up clients. For information, see "Dial-Up Networking" and "Mobile Computing."

Note: If you install the Exchange client and Microsoft Schedule+ 1.0, you will lose group scheduling capabilities.

Continued on page 366

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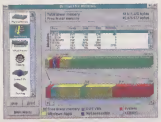
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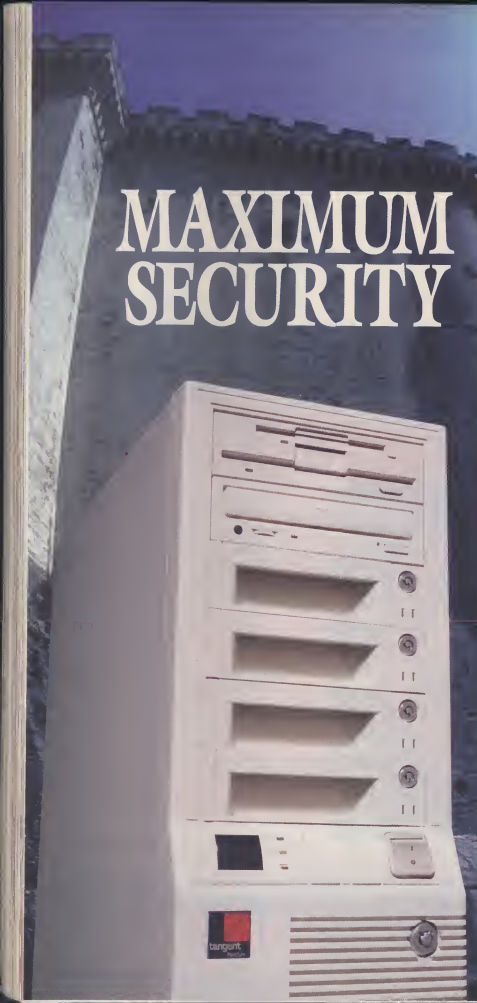
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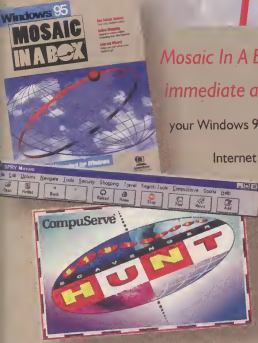
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Overview of Messaging

The Microsoft Exchange client can communicate with any e-mail system or messaging application that has a MAPI service provider, which is similar to a personal gateway. It specifies all the connection and addressing settings needed to communicate with a mail server on one end and with the Exchange client on the other end.

MAPI is a set of API functions and OLE interface that allows messaging clients, such as Exchange, to interact with various message service providers, such as Microsoft Mail and Microsoft Fax. MAPI helps Exchange manage stored messages and define the purpose and content of messages. For more information about MAPI, see "Technical Notes on the Microsoft Exchange Client and MAPI."

The Exchange client includes an OLE-compatible rich-text editor used for reading and composing messages; it supports the use of bullets, multiple font sizes and colors, and text alignments in messages.

If you install the Exchange client, Windows 95 provides several MAPI service providers. To install the Microsoft Mail Workgroup Post Office to work with Exchange, you must select it as a separate component under Exchange during Windows 95 Setup or afterward by using the Add/Remove Programs option in Control Panel.

Microsoft Mail Workgroup Post Office This post office is a workgroup edition of the Microsoft Mail Server, allowing one computer to host the post office and allowing other users to access that post office to send and receive mail. The workgroup post office provides the same features as the full Microsoft Mail Server, with the following exceptions:

- No mail exchange with users of other post offices.
- No access to Microsoft Mail gateways.
- Simplified administration tools.

Personal Address Book MAPI Service Provider This common address book can store e-mail addresses and other personal messaging information such as names, phone and fax numbers, and mailing addresses from multiple messaging service providers. A Personal Address Book is accessible from applications that use MAPI.

Personal Folder MAPI Service Provider The Personal Folder (.PST) stores messages, forms, documents, and other information in a series of hierarchical folders. A Personal Folder acts as a universal mailbox where users can send and receive messages from multiple service providers.

Microsoft Mail Services MAPI Service Provider This service provider connects the Exchange client to either the Microsoft Mail Workgroup Post Office or a Microsoft Mail Server (acquired separately) post office. To connect a computer running Windows 95 to the Microsoft Mail Server post offices, the post offices must reside on a network file server (such as Windows NT 3.5 or Novell NetWare) that supports the MS-DOS driver redirector.

See "Using the Exchange Client with Microsoft Mail," page 370, for information about configuring and using the Exchange client with a Microsoft Mail Workgroup Post Office.

Microsoft Fax MAPI Service Provider This service provider allows the Exchange client to send and receive faxes in the same way as e-mail. You can receive faxes in the same universal in-box as your mail, and use the same Personal Address Book for both mail and fax recipients. For more information, see "Microsoft Fax."

The Microsoft Network MAPI Service Provider This service provider allows the Microsoft Exchange client to send and receive mail on MSN, an online service accessible from the Windows 95 desktop. For details, see "The Microsoft Network."

Internet Mail MAPI Service Provider This service provider allows the Exchange client to send and receive mail directly on the Internet or other networks using the simple mail transport protocol (SMTP) and the Post Office Protocol 3 (POP3) over TCP/IP. This product is available as part of Microsoft Plus for Windows 95.

CompuServe Mail MAPI Service Provider This service provider allows the Microsoft Exchange client to send and receive mail using the CompuServe Mail Services. To use this service provider, you must have an account with CompuServe. For more information, contact CompuServe at (800) 848-8199.

Microsoft Exchange Server MAPI Service Provider This service provider will allow the Exchange client to connect to the Exchange server, which is a client-server messaging system that runs on Windows NT Server. This Microsoft product will be available after the release of Windows 95.

Installing the Exchange server will provide the Exchange client with specific functionality, including the following:

- *In-box Assistant:* A set of server-based rules for filtering, forwarding, replying to, and deleting messages
- *Out of Office Assistant:* A set of server-based rules for automatically forwarding and replying to mail when users are working away from the office.

Setting Up the Exchange Client

Installing and configuring the Microsoft Exchange client consists of the following steps:

- Install the Exchange client either during Windows 95 Setup or afterward in the Add/Remove Programs option in Control Panel or by double-clicking on the In-box on the Windows 95 desktop. The t Exchange client is automatically installed if you choose to install Microsoft Fax, MSN, or Microsoft Mail in the Get Connected dialog box during setup. For information, see "Introduction to Windows 95 Setup." You can also install the Exchange client after Windows 95 Setup in the Add/Remove Programs option in Control Panel.
- Choose the e-mail system to which you will connect the Exchange client.
- Set up a mail post office. If you choose the built-in Microsoft Mail workgroup post office and you are upgrading from previous Windows for Workgroups Mail or Microsoft Mail 3.2 post offices, you will not need to set up a new Microsoft Mail Workgroup Post Office.
- Set up the Exchange client by running the In-box Setup Wizard either during Windows 95 Setup or afterward in the Mail And Fax option in Control Panel.
- Choose the service providers you want during setup of the Exchange client, or afterward in the Mail And Fax option in Control Panel or in the Exchange client.

Important: If a Microsoft Mail Workgroup Post Office or other post office has not yet been set up when a user runs the In-box Setup Wizard, the Microsoft Exchange client can be only

Continued on page 370

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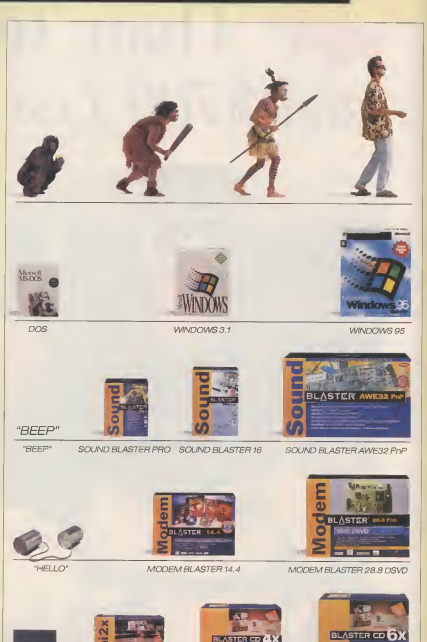
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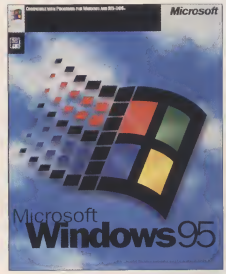
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Continued from page 366

partially configured. After setup, the post office administrator can configure the Microsoft Mail workgroup post office for all users in the workgroup in the Microsoft Mail option in Control Panel. When those users run the Microsoft Exchange client for the first time, the post office location automatically appears in the post office location box.

To install the Exchange client after setup, follow these instructions:

1. In the Add/Remove Programs option in Control Panel, double-click on the Windows Setup tab.
2. In the Components list, click on Microsoft Exchange, and then click on OK. Or double-click on the In-box on the Windows 95 desktop.

The In-box Setup Wizard guides you through the configuration steps. If you choose to add Microsoft Mail Services to Exchange, the wizard prompts you for the post office location (path name), user name, and password.

If you have already created a post office, added users to it, and shared it with all users on the network, the post office name and location automatically appear in the dialog box without requiring the user to type them. In this way, setting up the Microsoft Exchange client with the Microsoft Mail workgroup post office is seamless for all users in the workgroup except the post office administrator. For information about setting up a Microsoft Mail workgroup post office, see "Using the Exchange Client with Microsoft Mail," below.

After the wizard has finished, shut down and restart Windows 95 for the changes to take effect.

To add a service provider, double-click on the Mail And Fax option in Control Panel, and then click on Add. Or:

1. Click on Options from the Tools menu in Microsoft Exchange.
2. In the Options Properties, click on the Services tab, and then click on Add.
3. In the Add Services To Profile dialog box, click on the service providers you want, and then click on Add. For information about Exchange profiles, see "Using Multiple Exchange Profiles."

The services you select determine which specific dynamic link libraries (DLLs) are enabled when the Microsoft Exchange client is started. For example, if the Microsoft Mail service is added, the MSFS32.DLL file in the Windows SYSTEM directory is loaded. (To find out which DLLs are loaded for a service, click on the name of that service in the Exchange properties, then click on the About button.)

The service providers provide a setup wizard that prompts you for required configuration information. For information on Microsoft Mail, see "Using the Exchange Client with Microsoft Mail," below.

Tip: When troubleshooting Windows 95 mail issues, first remove the additional service providers (except Personal Address Book and Personal Folder), and then add back each service provider, one at a time.

Using the Exchange Client

This section describes how to use the Microsoft Exchange client, including discussions about Personal Address Book, Personal Folder, and sorting and viewing messages.

To start the Exchange client, double-click on the In-box icon on the desktop, or select Microsoft Exchange from the Programs menu.

Note: The Microsoft Exchange client opens in single-pane view if you start it by double-clicking on the In-box on the Windows 95 desktop. In single-pane view, folders and messages appear in one window. Clicking on the Show/Hide Folder List button on the toolbar in Microsoft Exchange switches to double-pane view. In double-pane view, you can drag and drop messages into folders.

The Exchange client automatically downloads mail from all service providers when you first open your In-box. Consequently, if you have added multiple service providers to the Exchange client, it might take several minutes to connect to and download mail from each of them.

After you open the Exchange client, you can choose to download mail from service providers one at a time or from all of them at once. You can also set time intervals for downloading mail from each service provider in the Properties box for each of them.

To download mail after you open the Exchange client, click on Deliver Now Using on the Tools menu, and then point to each service provider from which you want to download mail. If you installed only one service provider, the option on the Tools menu is named Deliver Now.

Using the Personal Address Book

The Microsoft Exchange client creates a Personal Address Book for each user when the In-box Setup Wizard is run for the first time. The Personal Address Book contains the names and addresses of people to whom users commonly send e-mail and fax messages. Users can add names and addresses to the Personal Address Book from other electronic address books, such as the Post Office Address List that comes with the Microsoft Mail Workgroup Post Office. Users can also modify the Personal Address Book (but they cannot modify address books from other service providers, such as MSN).

With the Personal Address Book, you can do the following:

- Find and select names within different address books.
- Modify names and addresses.
- Copy addresses from other address books into the Personal Address Book.
- Add custom addresses to send messages to other messaging services, such as MSN.
- Define groups of recipients (distribution lists) to which you want to send the same message.

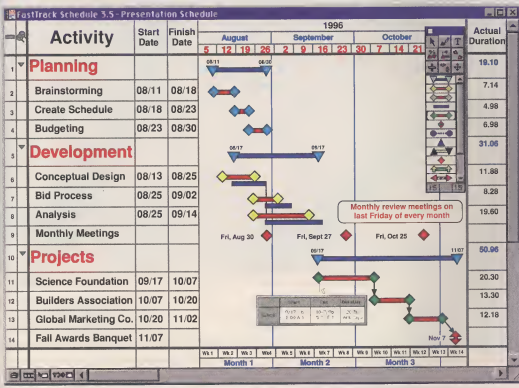
Tip: You can address a mail message to selected recipients from within the Personal Address Book dialog box by selecting a name, and then clicking on New Message on the File menu.

To find and select names within a Personal Address Book:

1. In Exchange, click on the Tools menu, and then on Address Book.
2. In the Address Book dialog box, click on Personal Address Book in the Show

Continued on page 378

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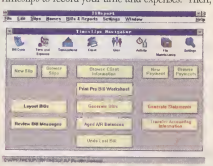


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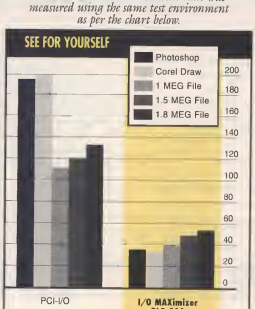
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** Overall performance scores (measured in seconds) based on Pentium®-90 system, 16MB RAM, on board PCI-I/O port and I/O MAXimizer for Printing PLD-311 with 4MB, printed on an HP 4Si.*

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Circle 342 on reader service card.

Continued from page 370

Names From box. The names in the Personal Address Book are displayed in the list box to the left.
3. To find a name, type it in the blank box above the list. The cursor automatically moves to that name in the list.
4. If you can't find a name, click on the Edit menu, and then click on the Find button. In the Find dialog box, type letters that are part of the name you want to search for, and then click on OK.

To modify names and addresses in the Personal Address Book:

1. In the Address Book dialog box, click on the Personal Address Book in the Show Names From box, and then double-click on a name in the list.
2. In the properties for that name, change the address, phone, business, and other information, and then click on OK.

To add names and addresses to a Personal Address Book from another address book:

1. In the Address Book dialog box, click on a different address book in the Show Names From box.
2. In that address book's list of names, click on a name, click on the File menu, and then click on Add To Personal Address Book.

To add a custom name and address to the Personal Address Book:

1. In the Personal Address Book, click on New Entry on the File menu.
2. In the New Entry dialog box, click on the type of address you want to add to the Personal Address Book.

Example: If the person is a member of MSN, select The Microsoft Network. In the Microsoft Network address dialog box, type the Member ID and Name.

Each messaging service has a different address dialog box. For example, if you select Internet, you must enter the SMTP and Alias of the recipient.

All messaging services include dialog boxes named Notes, Business, and Phone in which you can store additional information about the recipient.

To create a personal distribution list, follow these steps:

1. In Microsoft Exchange, click on the Tools menu, and then click on Address Book.
2. In the Address Book dialog box, click on File, and then click on New Entry.
3. In the New Entry dialog box, double-click on Personal Distribution List.
4. In the Distribution List dialog box, type a name for the personal distribution list, and then click on the Add/Remove Members button.
5. In the Edit Personal Distribution List Members box, type a name or select it from the displayed address book, and then click on Members to add it to the personal distribution list. You can add as many names as you want. When you are finished, click on OK.
6. In the Distribution List dialog box, click on OK to add the personal distribution list to the Personal Address Book.

To address a message to a personal distribution list:

1. In Microsoft Exchange, click on the Tools menu, and then click on Address Book.
2. In the Address Book, click on Personal Address Book in the Show Names From box.
3. In the Personal Address Book's list of names, select the name of the personal distribution list, click on the File menu, and then click on New Message. A message form will appear with the name of the personal distribution list in the *To:* box.

To select names when composing a message:

1. In Exchange, click on the Compose menu, and then click on New Message.
2. In the new message form, click on the Select Names button on the toolbar.
3. In the Select Names dialog box, click on a name, and then click on OK to address the message.

Configuring Addresses And Delivery Options

You can control how a message is addressed and delivered by specifying the following address and delivery options:

- The address book to be displayed first when selecting mail recipients.
- The address book to search first when looking for names that have been added manually.
- The address book in which to store personal names.
- The Personal Folder to which messages are delivered.
- The order in which service providers should send outgoing messages.

How to configure address options in the Exchange client:

1. In Control Panel, double-click on the Mail And Fax option, and then click on the Addressing tab. *Or:* From the Tools menu in Microsoft Exchange, click on Options, and then click on the Addressing tab.
2. In Addressing properties, click on an address book in the option named Show This Address List First.
3. Click on an address book in the option named Keep Personal Addresses In.
4. To specify the search order of address books, click on an address book in the option named When Sending Items, and then click on the up or down arrows to the right of the list box to set the order by which the Microsoft client searches address books.

To configure delivery options in the Exchange client:

1. In Control Panel, double-click on the Mail And Fax option, and then click on the Delivery tab. *Or:* From the Tools menu in Exchange, click on Options, and then click on the Delivery tab.
2. In Delivery properties, choose a Personal Folder File in the option named Deliver New Items To The Following Location.
3. To specify a second delivery location in case a network connection to a file server is temporarily lost, type the name of a secondary Personal Folder File in the Secondary Location box.
4. To specify an order in which service providers send messages, click on a service provider in the option named Recipient Addresses Are Processed By, and then click on the up or down arrows to the right of the list box to set the order in which service providers send messages.

Personal Folder Files

A Personal Folder File, located on a local computer, stores mail messages, forms, and other information in a series of hierarchical folders. The Personal Folder functions as your universal mailbox for sending messages to and receiving messages from service providers.

When you upgrade to Windows 95 from Windows for Workgroups Mail or Microsoft Mail 3.2, Windows 95 runs a Migration Wizard to convert the primary

Continued on page 382



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WIN95 INSTALLED

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Processor	Screen	HD	Price
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Pentium 75	10.4" Dual Scan	500MB	$ 3299
Pentium 75	10.4" Dual Scan	800MB	3589
Pentium 75	10.4" Dual Scan	1.2GB	4059
Pentium 75	10.4" Active	800MB	4719
Pentium 75	10.4" Active	1.2GB	5189
Ascentia 910N WIN95 INSTALLED			
486DX4/75	10.3" Dual Scan	510MB	$2469
486DX4/75	10.3" Dual Scan	700MB	2649
486DX4/75	10.4" Active	510MB	3119
486DX4/75	10.4" Active	700MB	3299

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- Quad Speed CD-ROM Drive
- Advanced Telephony – 14.4 or 28.8 fax/modem, telephone answering system, and speaker phone (differs by model, call for details)
- Loads of **FREE** software preinstalled
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- AST Works II navigation software – featuring "SPOT"

Chassis	Processor	HD	Price
Desktop (612)	Pentium 75	850MB	CALL
Minitower (812)	Pentium 100	1.2GB	CALL
Minitower (814)	Pentium 100	1.2GB	CALL*
Minitower (818)	Pentium 133	1.6GB	CALL

Monitors priced separately **16MB RAM standard*

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HiNote Ultra shown with Mobile Multimedia Station

If purchased from July1– October 1, 1995

Digital Starion

NEW! Windows 95 Multimedia Computers

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Chassis	Processor	HD	Price
Minitower (910)	Pentium 75	850MB	$1749
Minitower (915)	Pentium 100	850MB	1999
Minitower (920)	Pentium 75	1.2GB	2199
Minitower (930)	Pentium 100	1.2GB	2499
Minitower (940)	Pentium 133	1.2GB	2999

Monitors priced seperately

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- Built-In infrared
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Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	$2959
486DX2/50	9.5" Active	340MB	4119
486DX4/75	9.5" Dual Scan	528MB	3659
486DX4/75	9.5" Active	340MB	4579
486DX4/75	9.5" Active	528MB	4719

COMPAQ



Contura 410
Product differs slightly from photo.



LTE Elite

Contura 420/430

- 10.4" Active & Dual Scan
- Fast 486DX4/75 or 486DX4/100 processors
- Optical trackball – smoother & more reliable
- High capacity drives – up to 720MB
- Compaq, 3-year worldwide warranty

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	420MB	$2459
486DX4/75	10.4" Active	420MB	3029
486DX4/100	10.4" Dual Scan	720MB	2839
486DX4/100	10.4" Active	720MB	3499

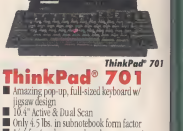
LTE Elite

- 10.4" Active Matrix display
- Fast 486DX4/75 processor
- Built-in AC adapter - small, sleek design & reduced weight
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	340MB	$2739
486DX4/75	9.5" Dual Scan	510MB	3119
486DX4/75	10.4" Active	510MB	4159
486DX4/75	10.4" Active	810MB	4539

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ThinkPad® 701

Additional IBM® Notebooks

Processor	Screen	HD	Price
ThinkPad® 755			
486DX4/100	10.4" Active	540MB	$4649
486DX4/100	10.4" Active	810MB	5099
486DX4/100	10.4" Active	540MB	5649*
486DX4/100	10.4" Active	810MB	6099*
Pentium 75	10.4" Active	540MB	4749+
Pentium 75	10.4" Active	810MB	5199+
Pentium 75	10.4" Active	540MB	5799
Pentium 75	10.4" Active	810MB	6249
486DX4/100	10.4" Active LCD	540MB	6099
486DX4/100	10.4" Active LCD	540MB	7099*
486DX4/100	10.4" Active LCD	810MB	7549*

**Features Built-In CD-ROM drive.*
+ Does not include built-in audio, telephony & modem

ThinkPad® 701

- Amazing pop-up, full-sized keyboard w/ jigsaw design
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- Only 4.5 lbs. in subnotebook form factor
- 14.4 fax/modem, speaker phone, answering machine & voice mail
- Built-in 16-bit sound, microphone, speaker & MIDI
- Built-in infrared for no hassle printer connections
- 20 **FREE** software titles preinstalled

Processor	Screen	HD	Price
486DX2/50	10.4" Active	360MB	$3699
486DX2/50	10.4" Active	540MB	4049
486DX4/75	10.4" Dual Scan	360MB	3549
486DX4/75	10.4" Dual Scan	540MB	3849
486DX4/75	10.4" Active	360MB	4299
486DX4/75	10.4" Active	540MB	4599

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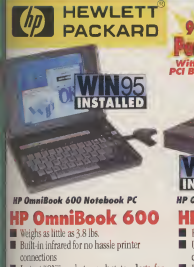
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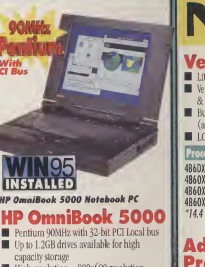


HP OmniBook 600 Notebook PC

HP OmniBook 600

- Weighs as little as 3.8 lbs.
- Built-in infrared for no hassle printer connections
- Instant "ON" ready-to-work state – lasts for months on a charge
- Built-in 16-bit sound, microphone & speaker

Processor	Screen	HD	Price
486DX2/50	8.5" Dual Scan	260MB	$2549
486DX4/75	8.5" Dual Scan	260MB	3049
486DX4/75	9.5" Active	260MB	3649



HP OmniBook 5000 Notebook PC

HP OmniBook 5000

- Pentium 90MHz with 32-bit PCI Local bus
- Up to 1.2GB drives available for high capacity storage
- High resolution – 800x600 resolution on notebook display
- Built-in 16-bit sound, microphone & speaker

Processor	Screen	HD	Price
Pentium 90	10.4" Active	1.2GB	$5579
Pentium 90	10.4" Active	1.2GB	6239*

*16MB RAM standard

NEC



Versa 4000

Versa 2000

- Lithium Ion battery technology
- VersaGlide touch-pad pointer – simple & accurate
- Built-in, upgradable 14.4 fax/modem (active models only)
- LOADS of **FREE** software preinstalled

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	350MB	$1999
486DX4/75	9.5" Active	350MB	2299
486DX4/75	9.5" Active	350MB	2599
486DX4/75	9.5" Active	540MB	2799

*14.4 fax/modem not built-in

NEC Versa 4000

- Built-in CD-ROM Drive! (Standard on some models, optional on others)
- Pentium 75 and Pentium 90 processors
- 256KB Level 2 Cache to optimize performance
- Unbelievable displays – 65K color Dual Scan, 16.8 million color Active/High resolution Active Matrix displays available – 800x600 res.)
- Built-in 16-bit sound, microphone, MIDI and 2 built-in speakers
- Multimedia Docking station with outstanding Altec Lansing 4 speaker array

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	540MB	$3499
Pentium 75	10.4" Dual Scan	540MB	3799*
Pentium 75	10.1" Active	540MB	4199*
Pentium 90	10.1" Active	810MB	4899*
Pentium 90	10.4" High Res.	810MB	5099

* Features built-in CD-ROM drive standard

Additional NEC Products

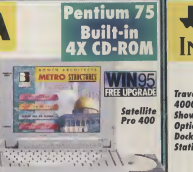
Chassis	Processor	HD	Price
NEC Ready Multimedia			
Mintower 5010	486DX4/100	540MB	$1499
Mintower 7020	Pentium 75	850MB	1799
Mintower 9010	Pentium 90	850MB	2099
Mintower 9510	Pentium 90	1.2GB	2499
Mintower 9520	Pentium 100	1.2GB	2799

Monitors priced separately

TOSHIBA

Pentium 75 Built-in 4X CD-ROM





Additional Products from Toshiba

Processor	Screen	HD	Price
Portégé 610CT (WIN95 READY)			
Pentium 90MHz	9.5" True Color	720MB	$4359
T2150 (WIN95 READY)			
486DX4/75	10.4" Dual Scan	500MB	$2929
486DX4/75	10.4" Active	500MB	3699
Satellite 2110/2130 (WIN95 READY)			
486DX4/75	10.4" Dual Scan	330MB	$1979
486DX4/75	10.4" DSTN Scan	500MB	2459
486DX4/75	10.4" Active	500MB	3059

Satellite Pro 400

- Built-in 4X CD-ROM Drive(Swap floppy & CD-ROM) (Active model only, optional on Dual Scan)
- Pentium 75MHz Processor
- Built-in 16-bit sound, microphone, speaker & MIDI
- 10.4" Active & Dual Scan
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use
- Lithium Ion battery technology
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75MHz	10.4" Dual Scan	810MB	$3539
Pentium 75MHz	10.4" Active	810MB	4359

TEXAS INSTRUMENTS



TravelMate 4000M

- **NEW!** 10.4" Active & 10.5" Dual Scan
- 16-bit sound card
- Integrated pointing device
- 2 Type II or 1 Type III PCMCIA slot

Processor	Screen	HD	Price
486DX4/75	10.5" Dual Scan	455MB	$2459
486DX4/75	10.4" Active	525MB	2799
486DX4/100	10.4" Active	525MB	3479

TM4000M CD-ROM Docking Station $809.99



TravelMate 5000

TravelMate 5000/5100

- 75MHz or 90MHz Pentium with PCI Bus to optimize Pentium processor performance
- 10.4" Active Matrix display with 2MB Video RAM
- 10.5" Dual Scan display with 2MB Video RAM
- 65K colors on notebook display
- 16-bit Sound Card, Speaker, Microphone & MIDI
- Upgradable hard drive - easily add more storage
- Built-In Dual Lithium Ion Batteries
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	$3899
Pentium 75	10.4" Active	772MB	4599
Pentium 90	10.4" Active	1.2GB	5299

PCC 10/95 (Win. Section)

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Circle 147 on reader service card.

Continued from page 378

message files (.MMF) to a Personal Folder File (PST format, as described in "Upgrading from Windows For Workgroups," below). During setup, Windows 95 looks first in the Windows subdirectory and then in the MSMAIL subdirectory for an .MMF file. It considers the first .MMF file it finds as the primary .MMF file and converts it. After setup, you can convert additional .MMF files to Personal Folder format by using the Import Mail Data option in the Microsoft Exchange client. You can also use this option to convert previous Personal Address Books (.PAB files).

To convert .MMF or .PAB files in the Exchange client:

1. In the File menu, click on Import.
2. In the Specify File To Import dialog box, type the path to the .MMF or .PAB file you want to import, and then click on Open.
3. In the Import Mail File dialog box, verify that the .MMF or .PAB is the one you want to import, and then click on OK.

The wizard leaves your original .MMF and .PAB files intact and copies the messages into the current Personal Folder or Personal Address Book.

Important: The Microsoft Exchange client, unlike the Microsoft Exchange server, does not support shared or replicated sets of folders to let large groups of people share documents and messages, and create rich views on them. If you have previously shared folders, they cannot be converted in the Microsoft Exchange client. You will lose the mail in these shared folders when you upgrade to Windows 95 unless you import the shared folders to another .MMF file.

You can add as many Personal Folder Files as you need. For example, you might want to create one Personal Folder File for archived messages and one for current messages. Or you could choose to have one Personal Folder File for messages from a specific service provider. However, no matter how many service providers you add to the Microsoft Exchange client, you need only one Personal Folder File.

Here's how to add a Personal Folder File in the Microsoft Exchange client:

1. In the Tools menu, click on Options.
2. In the Options dialog box, click on the Services tab, and then click on Add.
3. In the Add Service To Profile dialog box, click on Personal Folder, and click on OK.
4. In the Create/Open Personal Folder dialog box, type a filename for the Personal Folder File, and then click on Open.
5. In the Create Microsoft Personal Folders dialog box, type a name for the Personal Folder File. This name will appear in the Microsoft Exchange client In-box. Click on the type of encryption you want, and then type a password. Click on OK.

Note: Compressible Encryption is selected by default. The Personal Folder also supports password protection to maintain the privacy of your e-mail.

To help you manage the size of a Personal Folder, Windows 95 provides a Personal Folder compression feature. Choosing to compress a Personal Folder eliminates the empty spaces created when you delete messages.

To compress a Personal Folder in the Microsoft Exchange client, follow these steps:

1. From the Tools menu, click on Services, and then click on a Personal Folder File.
2. In the Personal Folders dialog box, click on Compact Now.

Note: Because a Personal Folder is a file in the Exchange subdirectory, it can be backed up in the same way as other files in Windows 95.

Sorting and Viewing Messages

The Microsoft Exchange client provides a number of ways for you to organize and manage e-mail messages and other information. When you first use Exchange, messages are arranged according to the date and time they were received, the sender's name, their subject, and size. You can reorganize how messages are arranged in a single folder or all folders in the following ways:

- Create a series of folders to keep groups of messages in each.
- Sort messages within a folder by category, such as the message subject title, the sender's name, and so on.

For information about performing these tasks, see the online Help for the Microsoft Exchange client.

To view a message-finder window in the Microsoft Exchange client, follow these instructions:

1. From the Tools menu, click on Find.
2. Specify the criteria you want to use to find messages. Click on Advanced to find messages according to their size, date, importance, or sensitivity.

Note: You can add OLE fields to the columns you want to view, or you can sort, filter, and search on these fields (in addition to the normal messaging properties). For more information about OLE in Windows 95, see "Application Support."

Working with Documents

You can attach files, messages, or objects to a mail message in Microsoft Exchange. You can also drag and drop files into Exchange, or drag and drop files attached to messages to other drives, folders, or documents on a local or networked computer. To use this OLE functionality, you must be in double-pane view. A button is provided on the Exchange client toolbar to switch between single and double-pane view.

To attach files, messages, or objects to messages in the Exchange client, click on the Insert menu in an Exchange message, and then click on File, Message, or Object.

To drag and drop files attached to messages, double-click on the file in the Exchange In-box and drag it to another folder in the Exchange client or to a drive or folder in My Computer or Network Neighborhood. Windows 95 saves the file as an .MSG file.

Note: To drag and drop files to another folder, the Microsoft Exchange client must be in double-pane view.

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To drag and drop files into a message in the Exchange client, double-click on a file in My Computer or in Network Neighborhood and drag it into an open Exchange message or folder.

Tip: You can use Microsoft Exchange folders as an alternate way to store and sort files. Consider creating a hierarchy of folders to store and categorize files, creating a personalized document library. You can create more elaborate and customized views in the Exchange client than is possible in the Windows 95 file system.

Using Multiple Exchange Profiles

The Microsoft Exchange client maintains one or more separate profiles for each user. A profile contains default settings for how messages are delivered to and from a mailbox. Individual users create a profile when they run the Inbox Setup Wizard for the first time. Other profiles can be added after running the wizard. The process of creating a profile is invisible to all but advanced users or network administrators.

With Exchange profiles, several users, each with an individual set of preferences, can share the same computer to send and receive mail. A single user can also switch between profiles—for example, between one for the office and one for a remote site. If a user is connected to multiple service providers, a profile securely stores any required passwords, allowing the user to log on to multiple mail systems with one password.

To add a profile in the Microsoft Exchange client, follow these steps:

1. In Control Panel, click on the Mail And Fax icon, and then click on Show Profiles.
2. In the Microsoft Exchange Profiles dialog box, click on Add. This starts the Inbox Setup Wizard, which leads you through the steps for creating a profile.

Users who share a computer, or who have multiple profiles, can select the profile to use when starting Windows 95.

Here's how to choose which profile to use at start-up:

1. From the Tools menu in the Microsoft Exchange client, click on Options.
2. In General Properties, click on the option named Prompt For A Profile To Be Used if you want to choose a profile each time you start Microsoft Exchange.
3. Click on the option named Always Use This Profile if you want to specify a default profile.

Note: To switch between profiles when running Microsoft Exchange, you must quit Microsoft Exchange and then choose a new profile when restarting.

Using the Exchange Client with Microsoft Mail

This section describes how to set up a Microsoft Mail workgroup post office to run with the Microsoft Exchange client. The first time you start Exchange, you must specify the location of your post office. If you have not yet set up a post office, you cannot fully configure the Exchange client. Consequently, you should set up a Microsoft Mail Workgroup Post Office before you run the Exchange client.

Upgrading from Windows for Workgroups

If you install Windows 95 in the directory formerly used by Windows 3.1 or Windows for Workgroups, the Microsoft Exchange client automatically upgrades the Windows for Workgroups Mail or the Microsoft Mail 3.2 Windows client to the Windows 95 Microsoft Mail Workgroup Post Office. Exchange reads existing MSMAIL.INI file to determine where to locate the Personal Folder (.PST) and the Personal Address Book (.PAB) files. In addition, the Exchange client automatically converts the primary .MMF file to .PST format, so that the Microsoft Mail Workgroup Post Office can read it. To convert any additional .MMF files, use the Import Mail Data option in the File menu, as described in Personal Folder Files.

If you upgraded from Windows for Workgroups to Windows 95, the Exchange client retains your workgroup post office for use with Windows 95. The mail post offices for Windows for Workgroups and for Windows 95 are identical, so any users using Windows for Workgroups can still share the post office. The Windows 95 Microsoft Mail workgroup post office cannot exchange messages with other Microsoft Mail workgroup post offices. To do this, you must upgrade the post office to a Microsoft Mail Server post office, as described in Upgrading to Microsoft Mail Server.

Setting Up a Workgroup Post Office

Setting up a Microsoft Mail Workgroup Post Office consists of the following tasks:

- Deciding the location for the post office.
- Deciding who will administer the post office.
- Adding users and user information, such as office locations and passwords.
- Sharing the post office with all users in the workgroup.

How to set up a Microsoft Mail Workgroup Post Office:

1. In Control Panel, click on the Microsoft Mail Post Office icon.
2. In the Microsoft Workgroup Post Office Admin dialog box, click on Create A New Workgroup Post Office, and then click on Next.
3. Specify where you want the workgroup post office to be located, and then Click on Next.
4. In the Administrator Account Details dialog box, type information about the post office administrator, including name and mailbox name, and a password to restrict administration of the post office to the administrator. Click on Next to finish creating the post office.

Important: Create only one post office for your workgroup, or your users will not be able to send mail to each other.

The Microsoft Workgroup Post Office Admin Wizard also allows you to manage the post office in the following ways: Add users to the post office, and Change user information, including replacing forgotten passwords.

The workgroup post office manager library, WGPOADMN.DLL, is the software component that supports administrative functions such as adding or deleting users and changing passwords.

To administer a post office, follow these instructions:

1. In Control Panel, click on the

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Microsoft Mail Post Office icon, and then click on Administer An Existing Workgroup Post Office.

2. In the space provided, type the password assigned to the administrator during setup of the post office, and then click on Next.
3. To add users to your post office, click on Add User. To change user information, such as a telephone number or a password, select a name from the list box, and then click on Details.

To allow users within a workgroup to access the Microsoft Mail Workgroup Post Office, you must share the directory where the post office resides. You can share the directory through Windows Explorer in the same way you share other resources.

To share a Microsoft Mail Workgroup Post Office, follow these steps:

1. In the Windows Explorer, right-click on the folder for your workgroup post office.
2. From the File menu, click on Properties, and then click on the Sharing tab.
3. In the Sharing folder, click on Shared As and verify the name of the post office in the Share Name field. You can also add a comment in the Comment field. Other people will see the comment when they look at a list of computers on the network.
4. Under Access Type in the Sharing folder, be sure to click on Full Access if you want all users in your workgroup to access the post office. Or, to restrict access to the post office by requiring a password, click on Depends On Password, and then type a password in the Full-Access Password field.

For information about user-level security, see "Security Issues."

When you configure Microsoft Mail using the In-box Setup Wizard, the wizard prompts you for a password. You can then specify whether the Microsoft Exchange client should save the password and automatically enter it when you start mail. This means that someone else using your computer can access your mail. You can change your mailbox password and require that Microsoft Mail ask for your password each time you log on to Windows 95.

How to change your mailbox password in the Microsoft Exchange client:

1. From the Tools menu, point to Microsoft Mail Tools, and then click on Change Mailbox Password.
2. In the Change Mailbox Password dialog box, type the old and new passwords, and then verify the new password. Then click on OK.

Note: The preceding procedure is for users to change their mailbox passwords on the built-in Microsoft Mail workgroup post office. If you are using the Microsoft Exchange client with another e-mail system, the exact procedure will vary.

To require that Microsoft Mail prompt for a password, follow these instructions:

1. In Control Panel, double-click on the Mail And Fax icon.
2. In Services Properties, double-click on Microsoft Mail.
3. In Microsoft Mail Properties, click on the Logon tab.
4. In the Logon dialog box, make sure the option named When Logging On, Automatically Enter Password is cleared.

Post Office Directory Structure

A Microsoft Mail Workgroup Post Office temporarily stores a message until a user retrieves it. It stores only one copy of each mail message, even when a message is addressed to multiple recipients. When sent to multiple recipients, a message has a reference count in it, which is decremented each time a recipient retrieves the message. The message itself is removed when the reference count drops to zero.

All subdirectories within the Microsoft Mail database must be present for it to function correctly. The following list details the subdirectories and describes their purpose.

- ATT Encrypted file attachments.
- CAL Microsoft Schedule+ calendar files.
- FOLDERS Public and private folders (with a filename extension .FLD) for use by MS-DOS workstations. (Folders on Windows for Workgroups workstations are located in their .MMF files on the workstations.) Notice that public folders are created in this subdirectory, but the Exchange client cannot view their contents.
- GLB Global system files for Microsoft Mail. These files contain local user log-on information and control files to generate mail files.
- HLP Help files.
- INF, TPL Post Office-defined templates: INF contains information files and TPL contains templates. ADMIN.INF and ADMIN.TPL contain template information for local post office users.
- KEY Index files that contain pointers to header records in the mailbag (.MBG) files.
- MAI Mail messages stored in encrypted form until the recipients' workstations retrieve them.
- MBG Mail headers that point to the mail (.MAI) files. For each file in this directory, there is a matching index (.KEY) file.
- MEM A list of the workgroup post office's members.
- MMF Mail message files.
- NME Pointer files for the name alias address lists. ADMIN.NME and ADMINSHD.NME list members of the post office address list.
- P1 Temporary storage for external programs.
- GRP, LOG, USR, and XTN Settings for multiple post office configurations. These subdirectories are useful only if you upgrade to the Microsoft Mail Server. In that case, USR lists user names and group names for the other network, XTN lists other external information, LOG contains output log files, and GRP contains public and private group pointer files.

Setting Up Microsoft Mail on Other Servers

You can connect computers running Windows 95 and Microsoft Exchange to a Microsoft Mail workgroup post office located on a Windows NT 3.5 server, Novell NetWare server, or any other independent network file server. Setting up a Microsoft Mail workgroup post office on a Windows NT or Novell NetWare server is identical to setting up such a post office to work with Windows for Workgroups. If you want to create the Workgroup Post Office on a Windows NT network server, see *Microsoft Windows NT Server 3.5 System Guide.*

Gaining Access to a Workgroup Post Office Remotely

With the Microsoft Exchange client and Microsoft Mail workgroup post office, you can send and receive mail while working away from the office. While offline, you can compose or reply to mail,

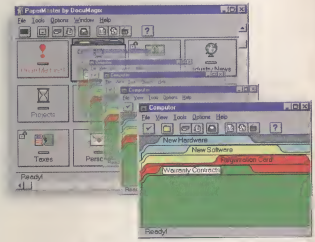
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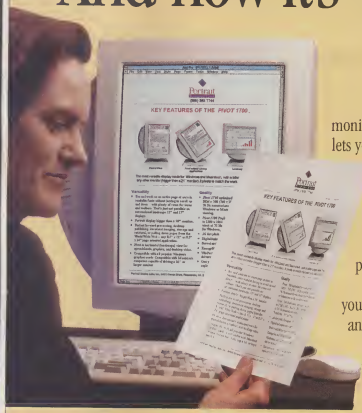
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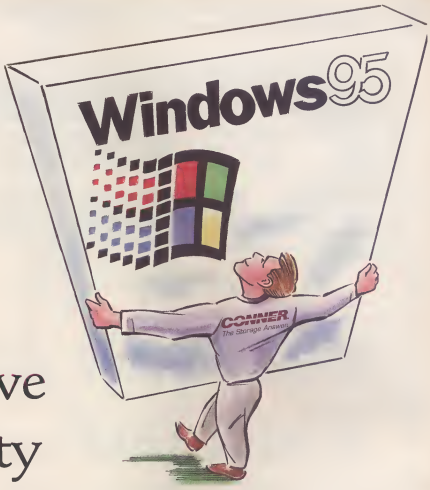
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Continued from page 390

and then, using a modem, telephone line, and Dial-Up Networking, you can establish a remote connection to your organization's network or to your computer, and send and receive mail.

Remote Preview of Mail After you dial in to the network, you can use Microsoft Mail to preview just the headers of new mail messages. That is, you can see who has sent you a message, the subject of the message, the size of the message, and the estimated time it will take to download it. This saves time and disk space by allowing you not to download unnecessary files. You can also use remote mail when connected to Microsoft Mail on the LAN.

Selective Download After you retrieve headers, you can mark messages to download or to delete. You can stay on the line after retrieving headers, or call later to download selected messages.

Dial-Up Networking

The Microsoft Exchange client relies on Dial-Up Networking to connect remotely to post offices. Because Windows 95 supports the TCP/IP, IPX/SPX, and NetBEUI protocols, you can use Dial-Up Networking to dial in to many types of remote access servers to access your post office. For information, see "Dial-Up Networking" and "Mobile Computing."

Offline Use You can compose and address mail offline, that is, while disconnected from a network. Messages are queued up in the Microsoft Exchange outbox until the next time you connect. You can also download a copy of the Microsoft Mail Post Office Address List onto a portable computer for addressing messages when working at a remote site.

Scheduled Connections You can dial in as needed to retrieve mail remotely, or you can set up scheduled connections to dial in at a specific time or at regular intervals.

Modem Sharing Through TAPI Exchange uses the Windows 95 telephony API (TAPI) to dial and retrieve mail remotely. TAPI allows applications to share a modem by arbitrating modem requests among applications. For example, configuring a modem to receive incoming faxes does not prevent you making a call to download mail. Microsoft Exchange also uses the TAPI Dialing Properties tool to handle multiple locations, hotel dialing prefixes, and credit card calls. For more information, see "Modems and Communications Tools."

Configuring Microsoft Mail for Remote Access

This section describes how to configure the Microsoft Mail workgroup post office for remotely accessing the network. Other mail applications might also allow remote access; however, the configuration procedures will differ.

Before you configure Microsoft Mail for remote access, you need to do following: install Dial-Up Networking, install a modem, and configure the server on which the post office resides for remote access.

To configure Microsoft Mail for remote access, you need to Define a Dial-Up Networking connection to that post office. The Dial-Up Networking New Connection Wizard is launched when you define a new connection.

You can set the following remote access features in Microsoft Mail Properties:

- Whether you want remote preview of mail messages.
- When you want to initiate and terminate a remote session.
- Whether you want to schedule an automatic connection time.
- Whether you want to remotely connect to a post office with a modem on start-up.

To configure Microsoft Mail for remote access, follow these steps:

1. In Control Panel, double-click on the Mail And Fax icon, click on Microsoft Mail, and then click on Properties. Or: From the Tools menu in Microsoft Exchange, click on Services. In the Services dialog box, click on Microsoft Mail, and then click on Properties.
2. In Microsoft Mail Properties, click on the Dial-Up Networking tab and specify a Dial-Up Networking connection for a remote-access session. To define a new connection, click on Add Entry. The Dial-Up Networking New Connection Wizard prompts you for the necessary information.
3. In Microsoft Mail Properties, click on Connection, and then click on the option named Remote Using A Modem And Dial-Up Networking.
4. If you click on the option named Automatically Sense LAN or Remote, Microsoft Mail queries the system to determine whether it should connect by using LAN or Dial-Up Networking.
5. If you want to work offline to compose or read mail messages before or after making a remote connection, click on Offline. This step should usually be done after logging on to Windows 95.
6. In Microsoft Mail Properties, click on the Remote Configuration tab. The option named Use Remote Mail option is selected by default. If you clear this option, Microsoft Mail automatically downloads mail after you have connected.
7. In Microsoft Mail Properties, click on the Remote Session tab and specify whether you want a remote session to start and end when you open and close Microsoft Mail, or to do so under other conditions.

Defining Scheduled Sessions You can schedule a remote session with Microsoft Mail by specifying a time and connection method. The scheduled sessions are stored in the Microsoft Exchange profile. You can specify up to 16 scheduled sessions, including the following:

- Sessions at a specific date and time.
- Sessions at prescribed intervals.
- Sessions at specific times on specific days of the week.

Follow these steps to define a scheduled session:

1. In Microsoft Mail Properties, click on the Remote Session tab, and then click on the Schedule Item Delivery button. Or, in the Tools menu in Exchange, click on Microsoft Mail, and then click on Schedule Remote Mail Delivery.
2. In the Remote Scheduled Sessions dialog box, click on Add.
3. In the Add Scheduled Session dialog box, click on the Dial-Up Networking connection you want to use to establish the remote connection, and then specify the time for a scheduled session. If you choose Every, then you must specify a prescribed time interval.

Note: If you click on Weekly On, the dialog box contents change so you can pick a date and time.

Selecting Messages to Download After you review headers for mail messages in remote mail, you can mark messages for selective downloading.

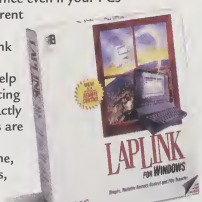
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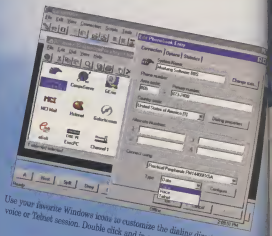
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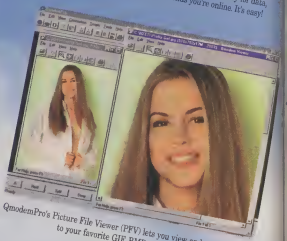
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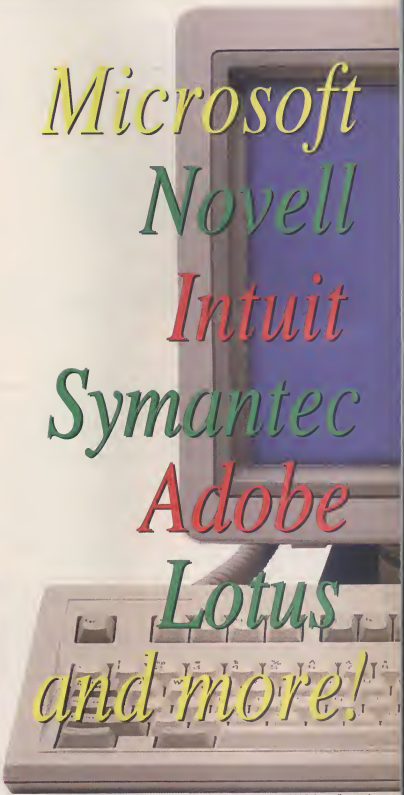
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To mark messages in the Microsoft Exchange client, follow these steps:

1. In the Tools menu, click on Remote Mail, and then click on Microsoft Mail. You can also click on other service providers if you have added them to Exchange.
2. In the Remote Mail For Microsoft Mail dialog box, click on the messages you want to preview.
3. Click on the Edit menu, and then click on Mark To Retrieve.

Technical Notes on the Microsoft Exchange Client and MAPI

The Windows 95 messaging subsystem architecture provides power and flexibility. The core of the subsystem is MAPI, an industry standard that enables applications in Windows 95 to interact with many different messaging systems using a single interface. The MAPI architecture defines messaging clients, such as Microsoft Exchange, that interact with various messaging service providers, such as Microsoft Mail and Microsoft Fax, through MAPI. MAPI divides messaging applications into four components: MAPI subsystem, messaging clients, messaging service providers, and messaging systems. The following is a discussion of the first three components.

MAPI Subsystem Messaging client applications communicate with service providers through the MAPI subsystem. The client interface interacts with the MAPI subsystem to access MAPI-compliant service providers.

The client interface is one of two major functional interfaces in MAPI; the other is the service provider interface. Messaging applications that require messaging services call functions in the client interface. For example, client applications can call MAPI functions to send, receive, save, and read messages. These functions are sent to the MAPI subsystem, which calls corresponding functions within the provider interface. Service providers then implement service-provider functions to perform the indicated actions for the client. The message spooler queues outgoing messages and routes incoming messages to the proper message store folder.

Messaging Clients Messaging client applications communicate with MAPI service providers through MAPI interfaces. Messaging client applications can be divided into three general categories:

- *Messaging-aware applications* include messaging functions as an added but not required feature, supporting the application's main purpose. An example of a messaging-aware application is Microsoft Word, which can add messaging functions by adding a Send Message command to its File menu.
- *Messaging-enabled applications* require some form of messaging functionality in order to meet the application's main purpose. Examples of messaging-enabled applications are the Microsoft Exchange client, Microsoft Mail, and cc:Mail.
- *Messaging-based workgroup applications* go beyond basic e-mail. These require full access to all the messaging services, including the message store providers, address book providers, and transport providers. Examples of this type of application are Microsoft Schedule+ and the public folders on an Exchange server.

For information about creating a messaging client, see the *Win32 Software Development Kit for Windows 95 and Windows NT* and the *MAPI 1.0 Developer's Guide.*

Messaging Service Providers A messaging service provider can include multiple message stores, address books, and messaging transport providers.

- *Message store providers* supply message storage, organization, and retrieval facilities for a messaging system.
- *Address book providers* supply message addressing and distribution list facilities to the messaging client.
- *Messaging transport providers* move messages between messaging clients or messaging stores.

MAPI selects between message store and messaging transport providers, as necessary, and merges the address books presented to it so the client application sees one combined address book interface. Other vendors can add or replace messaging service providers to enable the Exchange client to work with their mail systems.

Upgrading to the Microsoft Mail Server

You can upgrade your Windows 95 post office to a full Microsoft Mail Server post office by using the Microsoft Mail Post Office Upgrade product, which includes software, documentation, and licensing to extend the connectivity of your workgroup. The Microsoft Mail Server post office provides the following additional features:

- Executable and Help files that are not available in the Windows 95 Microsoft Mail Workgroup Post Office.
- Post Office support for connections to external post offices or gateways.
- An ADMIN account not created in Windows 95 Mail.
- Default ADMIN.TPL and ADMIN.INF files created in Microsoft Mail Server for adding the predefined extended user information in the workgroup post office structure.
- An administration utility (ADMIN.EXE) used to manage and configure the post office from any workstation on the network.
- Support files for external post office mail transfer through a network or modem.
- A routing program, EXTERNAL.EXE, that routes mail between multiple post offices and gateways.
- Client software for Windows 3.1, MS-DOS, and Apple Macintosh operating systems.

The Microsoft Mail Post Office Upgrade product includes the following components:

- Software to upgrade a workgroup post office to a full Microsoft Mail Server post office.
- Advanced administration tools, including tools for routing, directory synchronization, network group names, user access privileges, and mail log files, and for deleting old mail files and old Mail accounts.
- The EXTERNAL.EXE component, which provides the process for connecting post offices (by means of a physical or asynchronous link) with the platform for remote access.
- Client software for Windows 3.1, MS-DOS, Macintosh, and IBM OS/2 Mail.

If you want to set up a Windows 95 Microsoft Mail Workgroup Post Office to route mail between two or more post offices, you need to do the following:

- Purchase the Microsoft Mail Post Office Upgrade for each workgroup post office being connected, and then follow the directions provided in the product.
- Set up a dedicated MS-DOS–based

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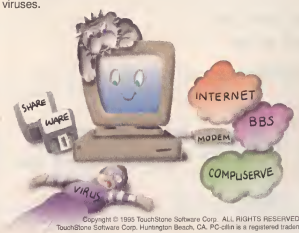
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Continued from page 402

computer to act as the router. It will be running the EXTERNAL.EXE program included in the Post Office Upgrade. Notice that this MS-DOS–based computer needs networking software to connect to your post office servers. If the post offices are stored on computers running Windows 95, then this computer needs a copy of Microsoft Workgroup Add-on for MS-DOS. If your post offices are on Novell NetWare servers, then the computer running MS-DOS needs Novell client software for MS-DOS.

If the post offices are not on the same LAN, you need a dedicated MS-DOS–based computer to run EXTERNAL.EXE at each site, plus a modem for communicating with the other sites. Notice that Microsoft also offers versions of EXTERNAL.EXE that run on IBM OS/2 or Windows NT servers.

Upgrading to the Exchange Server A next-generation client-server messaging system known as Microsoft Exchange Server will be available from Microsoft after the release of Windows 95. The Exchange Server provides advanced e-mail, scheduling, groupware applications, and custom application development. Exchange Server includes MAPI drivers that extend the capabilities of the Windows 95 Exchange client. For example, when Exchange is connected to an Exchange Server, you can access a replicated public folder, create custom forms and shared documents, schedule meetings with others, manage time and tasks, and create custom electronic forms for use in business.

The Exchange Server will require a computer running Windows NT Server Version 3.5 or higher. It also includes a built-in X.400 gateway, plus support for SMTP and for Microsoft Mail for Intel and Apple Macintosh computers. For more information about Microsoft Exchange Server, contact your Microsoft sales representative.

Microsoft Mail Gateways Many large organizations have multiple electronic messaging systems. In your organization, you might need to communicate with workgroups or organizations using e-mail systems other than Windows 95 mail, such as cc:Mail, HP Openmail, or IBM PROFS. Microsoft offers a complete line of advanced gateways that provide reliable and sophisticated connectivity between Microsoft Mail Server and virtually any other e-mail system within your organization.

Gateways ensure that messages always get across to their intended recipients. Addressing messages remains an easy process because people using other mail systems will be listed in your Microsoft Mail global address list—all you need to know is the name of the person you need to communicate with.

Microsoft offers gateways for the following: X.400, IBM PROFS, SNADS, SMTP, MHS, AT&T Easylink, MCI Mail, and fax.

Note: Microsoft Exchange Server will provide built-in support for X.400 and Internet Mail (SMTP). Users who upgrade to Microsoft Exchange Server will not need to purchase gateways for X.400 or SMTP.

Microsoft gateways support key features such as *messaging backboning* and *message encapsulation.*

• *Messaging backboning* lets organizations leverage their existing messaging resources by using these systems as high-performance bridges—or messaging backbones—between multiple Microsoft Mail sites.

• *Message encapsulation* makes it possible for users to place graphics, charts, sound, and video objects directly in mail messages for richer communication. Moreover, these complex messages can be sent across messaging backbones between distant sites without any loss of data integrity.

To connect a workgroup post office to another workgroup post office, you must purchase Microsoft Mail Post Office Upgrade for each post office. To connect to another message system, such as X.400 or SMTP, you'll need to install both Microsoft Mail Post Office Upgrade plus the appropriate gateway software.

Note: You will need at least one dedicated computer to act as the mail router, or the EXTERNAL.EXE program. Some gateways might require additional dedicated computers to connect to host systems. Before proceeding, you should determine your requirements by obtaining gateway data sheets.

Each message system can connect to the workgroup post office by using one or more specific gateways. The following table is a partial list of the Microsoft gateways needed for various message systems. If you use one of the message systems listed in this table, you need to purchase the appropriate gateway.

Microsoft Fax

This chapter describes how to use Microsoft Fax software to send and receive faxes and editable files—files that can be changed—from your computer.

With Microsoft Fax, users with modems can exchange faxes and editable files as easily as printing a document or sending an e-mail message. Microsoft Fax is compatible with the millions of traditional Group 3 fax machines worldwide, yet it provides advanced security and binary file transfer (BFT) features that make sharing information by means of a fax easier and more powerful.

To use Microsoft Fax, you must install Microsoft Exchange. Microsoft Fax has been integrated into Exchange as a MAPI service provider. All faxes sent to Microsoft Fax are received in the Exchange universal in-box. You can send a fax by composing an Exchange message, or by using the Send option on the File menu of a MAPI-compatible application (such as Microsoft Excel or Microsoft Word). In addition, Microsoft Fax includes a fax printer driver so that users can *print-to-fax* from within any Windows-based application.

Microsoft Fax provides the following key features:

Fax at Your Fingertips With Microsoft Fax, sending traditional faxes to Group 3 fax machines is as easy as printing a document. Additionally, Microsoft Fax uses the highest transmission speed and image compression supported by the recipient fax machine. Faxes sent in this way cannot be edited by the recipient.

Delivery by Address Type The MAPI service provider architecture allows you to mix different types of recipients in the same message. For example, it is possible to send a message simultaneously to Microsoft Mail, CompuServe, Internet,

Continued on page 410

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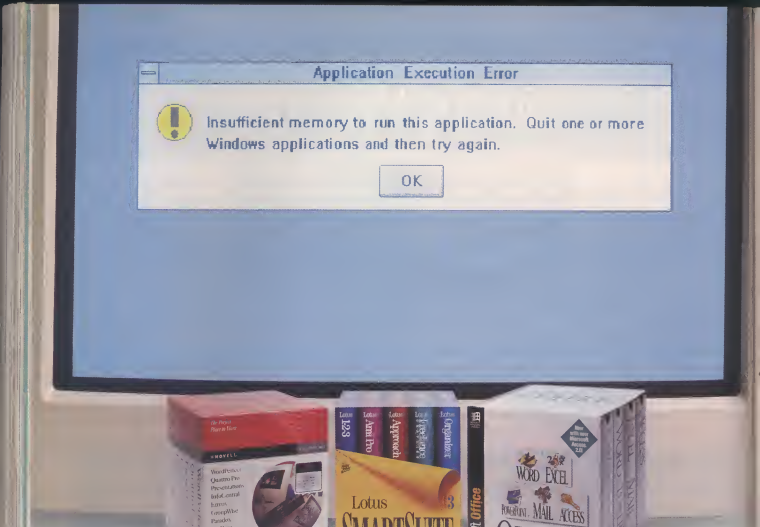
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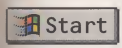
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and Microsoft Fax users as long as profiles for these destinations have been defined within Exchange. A recipient's fax address can be selected from the Exchange Personal Address Book, or the fax can be addressed by using an address that you use just once, such as fax: 555-1212.

Binary File Transfer Microsoft Fax supports Microsoft At Work BFT, which makes it possible to attach an editable document to a Microsoft Exchange mail message. These editable documents can be sent to users of Windows 95, Windows for Workgroups 3.11, and other Microsoft At Work–enabled platforms.

Security Microsoft Fax lets you securely exchange confidential documents by using public key encryption or digital signatures. Any security specified by the user is applied before the message is passed to the modem or connected fax device.

Network Fax Service You can install a fax device in one computer and share it with other users within a workgroup. Individual computers can have their own fax devices installed and still use the shared fax device.

Microsoft Fax Viewer The Microsoft Fax Viewer displays outgoing fax messages that have been queued to a local fax modem or to a Microsoft Fax network fax service. The Fax Viewer provides information about the current set of messages that are queued for transmission. You can also browse multipage faxes in thumbnail or full-page views.

Best Available Fax Format When you make a fax connection in Windows 95, Microsoft Fax queries and exchanges its fax capabilities with the recipient. This exchange of capabilities determines whether the recipient is a traditional Group 3 fax machine, which can only receive rendered faxes, or if the recipient has Microsoft Fax capabilities, and can receive editable files. Windows 95, Windows for Workgroups 3.11, and Microsoft At Work fax platforms are all capable of receiving binary files and traditional faxes.

- If the receiving fax device supports Microsoft Fax capabilities and an editable document is attached to an Exchange message, then the file is transferred in its native format, in the same way as e-mail.
- If the receiving fax device is a traditional Group 3 fax machine, then Microsoft Fax converts the document to the most compressed type of fax supported by the machine (MH, MR, or MMR compression type) and transmits the image by using the best available communications protocol supported by the mutual connection (that is, V.17, V.29, or V.27).
- If Microsoft Fax sends a noneditable fax to another Microsoft Fax user, then the fax is transmitted by using the Microsoft At Work rendered fax format. This special format is much more compressed, on average, than Group 3 MMR. Therefore, the exchange of noneditable faxes between Microsoft Fax users is always faster than between Group 3 fax machines.

Compatibility with Popular Fax Modems Microsoft Fax is compatible with Class 1 and Class 2 fax modems, and provides support for high-speed fax communications (V.17, V.29, and V.27).

Custom Fax Cover Pages With Microsoft Fax, you can create new fax cover pages with a cover page designer that lets you incorporate graphics and text, or you can customize one of the predefined cover pages included with Microsoft Fax.

Connecting to Fax Information Services

Microsoft Fax easily connects to fax-on-demand systems by using a built-in, poll-retrieve feature that allows you to retrieve rendered faxes or editable documents from a fax information service.

Before you install and configure Microsoft Fax on the network, you will need to decide the following:

- Which users need Microsoft Fax. For every user who needs Microsoft Fax, you must also install Microsoft Exchange. All faxes sent to that user are received in the Microsoft Exchange in-box.
- Whether to install fax modems on individual computers, or to designate a computer running Windows 95 to host a Microsoft Fax network fax service for other members of a workgroup.
- Which computer within a workgroup will host the Microsoft Fax network fax service. If the computer will also be used as a workstation, then a 486-based computer with at least 12MB of RAM is recommended. If the computer will be a dedicated fax server, then at least 8MB of RAM is recommended. A high-speed (14.4Kbps) fax modem is strongly recommended. Depending on fax volumes, a shared fax service with this configuration could support up to 25 network fax users.

> **Note:** When the computer hosting the shared fax modem receives faxes, Microsoft Fax does not automatically route them to individual in-boxes. The workgroup administrator must use Microsoft Exchange to send a received fax to the recipient's Microsoft Exchange in-box.

- Whether you want to control or restrict access to the shared fax service. You can control access by defining a shared fax password, as described in "Network Fax Services," below.
- Whether your workgroup's fax needs might be better served by a LAN fax server or commercial fax service. This depends on whether your organization has high fax volumes and inbound routing requests and as a result needs more detailed cost tracking and management. Microsoft is working with vendors of high-performance fax server platforms to ensure that their products are well-integrated with Windows 95 and Microsoft Fax.
- Whether your fax modems and fax machines are compatible with Microsoft Fax.

To ensure connections with the widest variety of fax applications, fax machines, and fax modems, Microsoft Fax supports the following international standards for fax communications:

1. International Telecommunications Union (ITU, formerly the CCITT) T.30 standard for Group 3 fax machines. Microsoft At Work capabilities such as BFT are implemented as T.30 NSF (nonstandard facilities), thereby maintaining compatibility with the installed base of Group 3 fax machines.
2. ITU V.17, V.29, and V.27 standards for high-speed fax communications (up to 14.4Kbps).
3. Class 1 and Class 2 fax modems. A Class 1 fax modem is required for Microsoft At Work BFT and security. Fax rendering to traditional Group 3 fax devices is available on both Class 1

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and 2 modems. Microsoft is working directly with fax modem manufacturers to ensure excellent compatibility.
4. MH, MR, and MMR compression for Group 3 fax communications.
5. Microsoft At Work fax platforms.

Overview of Microsoft Fax

Users can easily exchange faxes and binary files in Microsoft Fax because it is accessible from the Windows 95 desktop, from within applications, or through the Microsoft Exchange in-box. As a 32-bit application, Microsoft Fax works smoothly with other applications created for Windows 95 through its support for MAPI, TAPI, and OLE. The Send option in the File menu within any MAPI-enabled application (for example, Microsoft Excel or Word) will activate the Exchange Send dialog box. The document appears as an icon attached to the e-mail message.

To configure Microsoft Fax, do the following:

1. Install and configure a modem for sending and receiving faxes. For more information, see "Modems and Communications Tools."
2. Install Microsoft Exchange and Microsoft Fax. The Exchange Setup Wizard will guide you through the installation procedure.
3. Add Microsoft Fax to Microsoft Exchange.

After Microsoft Fax is configured, users can easily exchange rendered faxes and binary files. Because Microsoft Fax is provided with Windows 95 as a basic service, it is always available from within applications created for Windows 95 or through the Exchange in-box. Faxes are always received in a user's Exchange in-box.

Setting Up Microsoft Fax for Users

The easiest way to install Microsoft Fax is to choose it in the Get Connected dialog box during Windows 95 Setup. You can also install it after you install Windows 95 by using the Add/Remove Programs option in Control Panel.

How to install Microsoft Fax after Windows 95 installation:

1. In the Add/Remove Programs option in Control Panel, click on the Windows Setup tab.
2. In the Components list box, click on Microsoft Fax. If you have not previously installed Microsoft Exchange, Windows 95 automatically selects and installs it at this time. Click on OK.

To configure Microsoft Fax, follow these steps:

1. In Control Panel, double-click on the Mail And Fax icon, and then click on Add. Or, from the Tools menu in Microsoft Exchange, click on Options, click on the Services tab, and then click on Add.
2. In the Add Services to Profile dialog box, click on Microsoft Fax.
3. A Microsoft Fax warning message asks if you want to type your name, fax number, and fax device modem. Click on OK.
4. In Microsoft Fax Properties, click on the Message, Dialing, Modem, and User tabs, and type the appropriate information.

If you have installed a modem, Windows 95 automatically enters that information in the Modem Properties. If you have not installed a modem, or if you want to select a different modem for sending faxes, click on the Add button in the Modem Properties to run the Install New Modem Wizard.

Note: The information you type in User Properties automatically appears on the cover page of faxes you send in Microsoft Fax.

After you have configured Microsoft Fax, you can change its properties by clicking on the Setup option in the Fax menu in Microsoft Exchange. If you have problems setting up Microsoft Fax, see the troubleshooting information for Microsoft Fax in online Help.

Sending Faxes

You can use Microsoft Fax to send and receive faxes by using a fax modem attached to your computer or on a network. Faxes are mail messages that are sent over the phone lines. Microsoft Fax shares the Personal Address Book with Microsoft Exchange and other MAPI providers.

The only difference between a mail message and a fax, from a Microsoft Exchange user's perspective, is the format of the recipient's address. Each Microsoft Exchange service provider, such as the Microsoft Network or Microsoft Fax, has its own format for a recipient's address.

You can send faxes from within Windows 95 in the following ways:

- Use Microsoft Exchange to create an e-mail message and fax its contents to a recipient as described in the following procedures. If the message recipient is also using Windows 95, the message can include binary files and editable documents. Otherwise, the message will be rendered and sent as a fax.
- Print a document to the fax printer driver. If you select Microsoft Fax as the target printer for the document, and then click on the Print option in the File menu, the Compose New Fax Wizard will run.
- Run the Compose New Fax Wizard by double-clicking on the Fax icon in the Accessories menu.
- Use Windows Explorer to drag and drop a document onto a Microsoft Fax printer icon on the Windows 95 desktop.
- Right-click on a document icon in My Computer to display the context menu. In the context menu, select the Send To option, and then select the Fax Recipient option to run the Compose New Fax Wizard. The application that created the original document starts so that the document can be rendered (printed). After it is rendered, the application closes.
- Use the Send option in the File menu of a MAPI mail-enabled application such as Microsoft Word or Microsoft Excel to activate Microsoft Exchange.

Note: You can create a shortcut to the Microsoft Fax printer by right-clicking on the Microsoft Fax printer icon and then dragging it to the Windows 95 desktop.

To send a fax from Microsoft Exchange, follow these steps:

1. In the Compose menu, click on New Fax to run the Compose New Fax Wizard.
2. In the Compose New Fax Wizard dialog box, select the fax recipient's name and number from your Microsoft Exchange Personal Address

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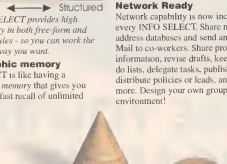
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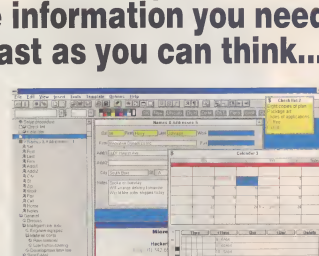
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Book, or create a new name, and then click on Next.

3. Click on Yes to include a fax cover page with your message, and then click on a type of predefined cover page, or click on Options to define a message format and a time to send the fax.
4. In the Next dialog boxes, compose your message and insert any binary files or objects you want to include in the fax.

To send a fax from the Windows 95 Start button, point to Programs, then Accessories, Fax, and then click on Compose New Fax.

With Microsoft Fax, you can attach a cover page to a fax by selecting from four predefined cover pages, or by creating a custom cover page for each recipient. The predefined cover pages are named Urgent, Confidential, For Your Information, and General Purpose (default). You can also customize predefined cover pages.

With the Microsoft Fax Cover Page Editor, you can also design a unique cover page for each recipient. The Cover Page Editor allows you to incorporate rich text, graphics, logos, and information from the Microsoft Exchange Personal Address Book into a cover page.

Note: All cover pages contain recipient information that you first entered in the Microsoft Exchange Personal Address Book. Microsoft Fax inserts this information each time you send a fax.

See the following online Help topics for information about creating cover pages in Microsoft Fax:

- Attaching a predefined cover page to a fax message.
- Customizing predefined cover pages.
- Creating a custom cover page.

Retrieving Faxes

With the Request a Fax option, you can retrieve faxes from fax machines, fax-on-demand systems, and other fax information services that support Group 3 poll-retrieve capability. Some Group 3 fax machines allow you to retrieve editable files, software updates, and fax images by using the Microsoft At Work BFT protocol.

To retrieve faxes, you start the Request A Fax Wizard in the Accessories menu or in Microsoft Exchange. The wizard allows you to download a specific document or a default document that includes the names of other available documents on the service.

To retrieve faxes using Request a Fax in Microsoft Exchange, click on the Tools menu, point to Microsoft Fax Tools, and then click on Request A Fax.

The Request a Fax Wizard guides you through the steps required to connect to a fax service and download faxes to your computer.

Network Fax Services

With Microsoft Fax, users in the same workgroup can share a fax modem that is installed on one of the computers in the workgroup. After the fax modem has been shared, all other users within the workgroup can send and receive faxes through it. The computer that is connected to the shared fax modem is called the fax server.

The Microsoft Exchange in-box of the fax server receives all of the faxes for the workgroup. The administrator for the server uses Exchange to route the faxes to their intended recipients in the workgroup. Received faxes appear in the Exchange in-box and each one is identified as a fax by a special icon. If the icon represents a rendered fax, double-clicking on it runs the Microsoft Fax Viewer application. Otherwise, Exchange opens the fax as if it were an e-mail message. You can forward and reply to faxes in the same way you would an Exchange mail message.

Note: Before you configure a computer running Windows 95 as a fax server, make sure it has enough memory and that it has a compatible modem. For memory requirements, see "Microsoft Fax: The Issues."

To configure a computer as a fax server in Exchange, follow these instructions:

1. Click on the Tools menu, click on Microsoft Fax Tools, and then click on Options.
2. In the Microsoft Fax Properties dialog box, click on the Modem tab.
3. In Modem Properties, make sure the option named Let Other People On The Network Use My Modem To Send Faxes is checked.
4. To change the Share Name for the shared fax modem, click on the Properties button, and then type a new name. By default, Microsoft Fax displays the name of the Network Fax shared directory. You can also define security in the shared directory's properties. If you have user-level security enabled, you can define which users can have access to the network fax service, and define their access rights. If you have share-level security enabled, you can define whether a password is required to connect to the network fax service. For more information, see "Security Issues." If you choose Full Access (the default), all users within the Windows 95 workgroup can send faxes by using the shared fax service.
5. Click on OK to enable the Microsoft Fax shared fax server.

Note: Other users in the Windows 95 workgroup must know the fax server's full network name to access it. The name is formed by joining the server's computer name (defined in the Network option in Control Panel) with the shared directory name, for example, \\JOELLEN\NETFAX.

To configure a computer as a client to the fax server in Exchange, follow these steps:

1. Click on the Tools menu, click on Microsoft Fax Tool, and then click on Options.
2. In the Microsoft Fax Properties dialog box, click on the Modem tab.
3. In Modem Properties, click on Add.
4. In the Add a Fax Modem dialog box, click on Network Fax Server, and then click on OK.
5. In the Connect to Network Fax Server dialog box, type the network name of the fax server and then click on OK.
6. In the Microsoft Fax Properties dialog box, click on the server name, and then click on the Set as Active Fax Device button.

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Security Issues

Microsoft Fax protects valuable and confidential documents through encryption and digital signatures. An encrypted fax can be read only by the intended recipient, who has a set of keys to unlock it or a password. A digitally signed fax allows a recipient to verify that the purported sender of the fax is the actual sender. You can use a digital signature on its own or add a digital signature to a fax protected with password or key encryption.

Password and Key Encryption You can encrypt a fax or binary file by using either a simple password or a public or private key pair. Password encryption, which is the simplest security method, scrambles a fax based on a specific password. The fax recipients can only unscramble the fax if they know the password. Password encryption does not require the exchange of public keys with your recipients, but you will need to tell them the password that you used to secure the fax.

When you use key encryption, Microsoft Fax assigns you two security keys, a private key and a public key. You can exchange public keys with anyone you choose. When you send a key-encrypted message, Microsoft Fax uses the recipient's public key and your private key to encrypt the message. When the message is received, Microsoft Fax uses your public key and the recipient's private key to decrypt it. Using your own private key ensures that the message could have been sent only by you. Using the recipient's public key ensures that only the recipient can unlock the message. You can store and maintain the public keys you receive from other users in your Microsoft Exchange Personal Address Book.

Note: Microsoft Fax applies security only to those faxes that have been sent as editable files. Rendered faxes cannot be secured.

Digital Signatures Using a digital signature to secure a fax is similar to notarizing a document; it verifies for the recipient that the person who signed the document is the person who sent it. Digital signatures prevent anyone but the sender from modifying the document while it is being sent.

Digital signatures can only be used with binary file documents, that is, those that have been attached to mail messages (not rendered). Before you can use digital signatures, you must establish security and exchange public keys with a recipient.

Establishing Security and Exchanging Keys The first step in using key encryption or digital signatures is to establish security.

To establish security in Microsoft Exchange, follow these instructions:

1. Click on the Tools menu, point to Microsoft Fax Tools, and then click on Advanced Security.
2. In the Advanced Fax Security dialog box, click on the New Key Set button.
3. In the New Key Set dialog box, type a password, and then click on OK. This password will be used for sending and receiving both key-encrypted and digitally-signed faxes. Microsoft Fax automatically creates a public and private set of keys for you, and then it displays the Advanced Fax Security dialog box.
4. Click on the Change Password button to change your fax security password but keep the same key set, or click on New Key Set to create a new key set.

To use the key set to send and receive secured faxes, you must exchange public keys. To exchange public keys, you must save your public keys to a file that you can send to other users, or add other users' public keys to your address book.

How to exchange a public key with another user in Exchange:

1. Click on the Tools menu, point to Microsoft Fax Tools, and then click on Advanced Security.
2. In the Advanced Security dialog box, click on the Public Keys button.
3. In the Managing Public Keys dialog box, click on Save.
4. In the Save Public Keys dialog box, click on the public keys that you want in the list box, and then click on the To: button to identify the folder where you want to save these keys. Type a name for the public keys with the file extension .AWP, and then click on OK.

If you receive a public key from another user, you will need to import the .AWP key file into Microsoft Fax. After you and your recipient have exchanged public keys, you will be able to exchange secured faxes. The easiest way to exchange public keys is through e-mail. Compose a message in Microsoft Exchange and insert your .AWP file into the message. The recipient must save the .AWP file to a directory and import the public keys into Microsoft Fax.

To import the .AWP file in Microsoft Exchange, follow these steps:

1. Click on the Tools menu, point to Microsoft Fax Tools, and then click on Advanced Security.
2. In the Advanced Security dialog box, click on Public Keys.
3. In the Public Keys dialog box, click on Add, and then specify the path to the .AWP file.

Sending Secured Faxes

Microsoft Fax allows you to secure a fax on a per-message basis.

To send a secured fax, follow these steps:

1. In the Compose New Fax Wizard, click on the Options button, and then click on the Security button.
2. In the Message Security Options dialog box, choose from the following methods of securing a fax:
   - Click on the Key-Encrypted option to encrypt your fax by using RSA public key encryption.
   - Click on the Password Protected option to assign a password to the fax.
   - Click on the option named Digitally Sign All Attachments to apply a digital signature to a document that you have attached to a mail message. You can add a digital signature to a key-encrypted or password-encrypted fax.

Technical Notes for Microsoft Fax

This section describes technical information about Microsoft Fax architecture and Registry entries.

You can send faxes either by using the mail client or the Microsoft Fax printer driver. In each case, the message is sent to the Microsoft Fax service provider by using MAPI. If you sent the message from a mail client, it might contain text, embedded OLE formats, and attachments. If you sent it by using the Microsoft Fax printer driver, the mail message will contain a rendered format of the file as an attachment to the mail message.

Continued on page 426

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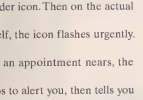
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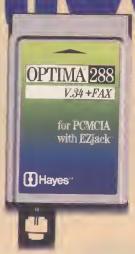
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Continued from page 422

MAPI allows messages to be pre-processed based on the transport protocol used to send them. The transport protocol chooses the correct modem connection, uses TAPI to create a dial string, and sends the message to that recipient. The preprocessor determines whether to render the message into a fax form to be printed by a fax machine. The rendered format is attached to the original message as a message property and is deleted either when the message is sent or when the transport protocol tries to send the message but determines that it cannot.

If the message does not have to be rendered, the message is converted from its original binary format to a line image (also called a linearized form), and then it is compressed.

After the message is submitted, the transport protocol determines what type of recipient the message is intended for as follows:

- If it is a traditional fax recipient and the user has selected Printed Form or Best Available, Microsoft Fax will render the document into the standard Group 3 image format. This can be used by standard fax machines and software. If the user selects Editable Form, an error message is returned.
- If the recipient is a Microsoft At Work–enabled recipient and the user has selected Printed Form, then it will render the document into the Microsoft Fax rendered format. This format provides high quality images of smaller size than standard Group 3 and it is used between Microsoft At Work devices, including fax machines and printers.
- If the recipient is a Microsoft Fax recipient and the user has selected Editable Form, no rendering is required.
- If there is a mix of recipients, and the user has selected Best Available, then Group 3 and editable versions of the document are packaged in the message.
- If the capabilities of the recipient are unknown, Microsoft Fax creates multiple formats to be sure that the proper format is available upon connect.

Fax-form messages sent to Microsoft At Work devices will be sent by using BFT with the resource-based rendering of the message sent as an attachment.

The Registry keys for a fax modem are found in:

```
Hkey_Local_Machines\Software\⊃
⊂Microsoft\At Work Fax\⊃
⊂Local Modems
```

For each local modem that has been installed by Windows 95, information is stored in the key named TAPInnnnnnnnn, where *nnnnnnnn* is an arbitrary number assigned by TAPI. The TAPI key contains subkey values. Values that are important to the system administrator are described in the following lists.

The modem command strings used to reset the modem whenever Microsoft Fax acquires it from TAPI:

ResetCommand This "AT" command string includes:

- Load factory defaults: &F
- Disable auto-answer: S0=0
- Echo off: E0
- Verbose on: V1
- Quiet off: Q0

The default depends on fax modem. Typically, AT&FS0=0E0V1Q0.

The setup modem command string used to set up the modem before dialing or answering:

SetupCommand This "AT" command string includes:

- Max dial-tone timeout: S7=255
- Tie DTR drop to reset: &D3
- XON/XOFF flow control: Varies

The default depends on fax modem. Typically, ATS7=255&D3&K4.

ExitCommand This command string is issued to the modem after hang-up, and just before releasing the port. The default is empty.

FixSerialSpeed This command string specifies the port speed. The default is 19,200 bps.

PreAnswerCommand This modem command string is issued to the modem just before issuing the ATA (answer) command. Microsoft Fax will have already issued the Setup command, and the command to go to the appropriate Fax Class (Class 1 or 2). The default is empty.

PreDialCommand This modem command string is issued just before issuing an ATA (dial) command. Microsoft Fax will have already issued the Setup command, and the command to go to the appropriate Fax class (class 1 or 2). The default is empty.

HighestSendSpeed This modem command string specifies the highest speed to try sending a fax, in bits per second. A value of zero forces the highest available speed. The default is zero.

LowestSendSpeed This modem command string specifies the lowest speed to try sending a fax, in bits per second. A value of zero forces the lowest available speed. The default is zero.

EnableV17Send If zero, this command string disables use of V.17 (14.4Kbps, short train) for sending. The default is one.

EnableV17Recv If zero, this command string disables use of V.17 (14.4Kbps, short train) for receiving. The default is one.

The Microsoft Network

A connection to the Microsoft Network (MSN) is built into Windows 95. If users already have a modem and phone line, all they have to do is install MSN during or after Setup, and click the icon on the desktop to connect to MSN and become a member. After setting up an account, users can connect to MSN by clicking its icon.

Multitasking MSN takes advantage of the multitasking and multithreaded design in Windows 95 so that several different tasks in MSN can run at the same time. For example, while a file is downloading, users can browse, read electronic mail, participate in a chat room, or do anything else on MSN.

Security Issues The MSN security service authenticates and validates multiple members simultaneously logging on and off. The security service grants or denies members, requests to log on and to use different areas of the service based on the rights assigned by the MSN database. In addition, MSN establishes and manages policies that govern what actions members can perform. This ensures the confidentiality of data and the value of transactions in MSN.

The member identification users choose when they sign up must be unique to MSN. After a membership is terminated, MSN does not reissue that member's member ID for 12 months to prevent confusion.

MSN maintains a Client Negation record, which is a list of members who have been denied access for reasons of bad credit, repeated violations of MSN rules, and so on. Members can also be excluded from individual forums for violations of rules. When users sign up, the MSN accounts database verifies that they are not on this list before approving their member IDs and passwords.

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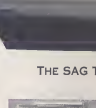
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A Guide to Troubleshooting

Sure, Windows 95 is the panacea for all your computing headaches. Plug and Play hardware means no more installation and troubleshooting problems, and your PC is finally as easy to use as your VCR (or easier—after all, you still have to figure out that nagging, blinking 12:00 problem). Now if you believe that, we have some swampland we need to discuss with you. True, Windows 95 is far superior to its predecessors DOS and Windows 3.x in ease of configuration and crash protection, but it's still a far cry from Utopia. Or from a Macintosh. So here are a few pointers from Microsoft's *Windows 95 Resource Kit* to help you when things go bump in your system. **YL**

Analyzing Symptoms

Start troubleshooting by analyzing symptoms to determine a strategy for resolving the problem. Under what conditions does the problem occur? Which aspects of the operating system control those conditions? Is the problem specific to a subsystem (networks, video, and so on)? Consider the following:

- Has the system or configuration ever worked? If so, what has changed?
- Is the error condition reproducible or random?
- Is the error specific to a particular system, configuration, or application?
- What specific hardware and firmware is involved?
- Are any non–Windows 95 device drivers or TSRs loaded?
- Does the order in which drivers or applications start up make a difference?
- Does the error still occur with Safe Mode or Safe Mode with Network Support? (These startup options are described in "Using Windows 95 Startup Menu Options.")

Checking for Common Issues

Check to see if the problem is a common issue by reviewing online Help and any .TXT files included on the Windows 95 distribution disks. For example, check SETUP.TXT and README.TXT.

The online help includes troubleshooting aids for printing, running out of memory, freeing disk space, hardware conflicts, running MS-DOS programs, using the network, using your modem, using dial-up networking, using direct cable connection, using a portable computer card (PCMCIA), and starting Windows 95.

Isolating and Testing Errors

Eliminating variables helps determine a problem's cause. You can isolate specific causes by removing unnecessary lines in CONFIG.SYS and AUTOEXEC.BAT.

You can also isolate the cause by changing a specific value and then testing to see if the problem has been corrected or altered. For instance, if you suspect a damaged Registry, you could restore the Registry files (SYSTEM.DAT and USER.DAT) from backup files and then retest.

If a component fails after upgrading to a new driver, replace it with the original driver and retest. If Windows 95 startup fails while loading a real-mode device driver, or if you suspect any device driver of causing an error condition, you can test the effect of not loading a particular device driver. To bypass individual, real-mode device drivers, press F8 when the Starting Windows message appears, and then select Step-By-Step Confirmation. Removing protected-mode drivers can be done in Device Manager.

Test each modification individually to see if it has solved the problem. Make note of all modifications and their effect on the symptoms. This provides you with the information you need to contact product support personnel, if necessary, and serves as an excellent reference for future troubleshooting.

Getting Answers to Your Technical Questions

For answers to your questions and help with technical problems regarding Windows 95, first check online Help (press

FYI WHERE TO FIND **MORE INFORMATION**

For general information about the problems listed in the following table, see the related chapter in the *Windows 95 Resource Kit*.

Cannot install Windows 95	See Setup Technical Discussion
Computer won't start or Windows 95 won't run	See Setup Technical Discussion
Network connectivity problem	See Introduction to Windows 95 Networking
Local or network printing problem	See Printing and Fonts
Application error or general protection fault	See Application Support

Continued on page 438

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Continued from page 434

the F1 key), the printed documentation set, and the information in the following files: DISPLAY.TXT, NETWORK.TXT, GENERAL.TXT, PRINTERS.TXT, INTERNET.TXT, README.TXT, MOUSE.TXT, SETUP.TXT, MSN.TXT, SUPPORT.TXT.

For fast answers to common questions and a library of technical notes delivered by recording or fax, call Microsoft FastTips for Windows 95 at (800) 936-4200. This is an automated system accessible by Touch-Tone telephone 7 days a week, 24 hours a day, including holidays.

Use The Microsoft Network or CompuServe to interact with other users and Microsoft Product Support Services (PSS) engineers, or to access the Microsoft Knowledge Base for product information. For CompuServe members, type GO WINNEWS to access the forum for Windows 95, or type GO MSKB to access the Microsoft Knowledge Base at any ! prompt. For an introductory CompuServe membership kit, call (800) 848-8199 and ask for operator 463. For information about Microsoft forums on CompuServe, see "Microsoft CompuServe Forums"; for information about Knowledge Base, see "Microsoft Knowledge Base."

Use the Microsoft Download Service (MSDL) to access the latest technical notes on common support issues for Windows 95 or access the Windows Driver Library by modem. The MSDL is available by modem at (206) 936-6735, 7 days a week, 24 hours a day, including holidays. For more information, see "Microsoft Download Service" and "Obtaining Drivers Electronically."

Contact a Microsoft Solution Provider if you need installation services and follow-up product support. These companies have Microsoft Certified Professionals on Windows 95. For a referral to a Microsoft Solution Provider in your area, call Microsoft at (800) 765-7768. For more information, see "Microsoft Solution Providers."

Get technical support from a Microsoft engineer. Support is available free of charge from a Microsoft PSS engineer via a toll line for the first 90 days you're using Windows 95. The 90-day period begins the day of your first call. Call (206) 637-7098 between 6:00 a.m. and 6:00 p.m. Pacific time, Monday through Friday, excluding holidays. For support outside the United States, contact your local Microsoft subsidiary.

After the initial 90-day free period has expired, support is available from a Microsoft PSS engineer and charged either by the length of time required or at a fixed rate. Call (800) 936-5700 for more information.

Microsoft Text Telephone (TT/TDD) services are available for people who are deaf or hard of hearing. Using a special TT/TDD modem, dial (206) 635-4948, between 6:00 a.m. and 6:00 p.m. Pacific time, Monday through Friday. For more information about the accessibility of Microsoft products and services for the deaf or hard of hearing, see "Accessibility."

Support Online

Got a modem? Use it! When possible, post notes about persistent problems on the appropriate online forum. Other users may have already discovered, reported, and found workarounds for your problem. Suggestions from others may save you time tracking down the source of the problem, and might give you ideas that can help.

For information about Microsoft TechNet and how to get help from product support using online resources such as The Microsoft Network, see "Windows 95 Resource Directory."

For Windows 95 information, see the WinNews areas on most major online services and networks as listed here:

- The Microsoft Network: From the Windows 95 desktop, click on the Microsoft Network icon. Then click on Microsoft, and in the Microsoft menu, select Windows 95. Click on WinNews.
- America Online: Keyword: WINNEWS
- CompuServe: GO WINNEWS
- FTP: ftp://ftp.microsoft.com/PerOpSys/Win_News
- GEnie: Download files from the WinNews area under the Windows 95 RTC.
- Prodigy: JUMP WINNEWS
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The Startup Menu

If the system fails to start, Windows 95 displays a Startup menu that contains troubleshooting options. You can also manually prompt Windows 95 to display the Startup menu.

To display the Windows 95 Startup menu, restart the computer. When the "Starting Windows 95" message appears, press F8.

The following describes Startup menu options. The contents of this menu may vary depending on the options specified in the MSDOS.SYS and the configuration of the computer.

Normal Starts Windows, loading all normal startup files and Registry values.

Logged Runs system startup and creates a startup log file. For information about using BOOTLOG.TXT, see Setup Technical Discussion.

Safe Mode Starts Windows, bypassing startup files and using only basic system drivers. You can also start this option by pressing F5 or typing win /d:m at the command prompt.

Safe Mode Command Prompt Only Starts the operating system in Safe Mode and displays only the command prompt, bypassing startup files. Same as pressing Shift-F5.

Safe Mode with Network Support Starts Windows, bypassing startup files and using only basic system drivers, including basic networking. You can also start this option by pressing F6 or typing win /d:n at the command prompt.

Step-By-Step Confirmation Starts Windows, confirming startup files line by line. You can also start this option by pressing F8 when the Startup menu is displayed. For more information, see Step-By-Step Confirmation.

Command Prompt Only Starts the operating system with startup files and Registry, displaying only the command prompt.

Previous Version of MS-DOS Starts the version of MS-DOS previously installed on the computer. You can also start this option by pressing F4. This option is only available if BootMulti=1 in MSDOS.SYS.2.

When you start the computer at the command prompt you can use switches with the WIN command to control startup for troubleshooting purposes, as described in Using WIN.COM Switches.

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determine when to use these Startup menu options to troubleshoot system problems.

Tip: Windows 95 uses entries in the MSDOS.SYS file to control Startup menu options, automatic loading of certain drivers, and path statements for system files. If Windows 95 does not start as expected, check the entries in MSDOS.SYS.

Safe Mode

If Windows 95 fails to start normally, select Safe Mode from the Startup menu to begin troubleshooting. Windows 95 automatically initiates Safe Mode if it detects that system startup has failed (for example, if a WNBOOTNG.STS signature file still exists in the Windows directory), or if the Registry is corrupted (for example, an important key such as SYSTEM is missing), or if an application requests Safe Mode.

Safe Mode bypasses startup files—including the Registry, CONFIG.SYS, AUTOEXEC.BAT, and the [Boot] and [386Enh] sections of SYSTEM.INI—and provides you with access to the Windows 95 configuration files. You can make any necessary configuration changes and then restart Windows 95 normally.

Use Safe Mode for system startup in situations such as the following:

- Windows 95 fails to start after the Starting Windows 95 message appears.
- If Windows 95 seems to stall for an extended period.
- If Windows 95 doesn't work correctly or has unexpected results.
- If you cannot print to a local printer after attempting other troubleshooting steps.
- If your video display doesn't work correctly.
- If your computer stalls repeatedly.
- If your computer suddenly slows down.
- If you need to test an intermittent error condition.

When starting Windows 95 in Safe Mode, only the mouse, keyboard, and standard VGA device drivers are loaded. This makes Safe Mode useful for isolating and resolving error conditions caused by both real-mode and Windows drivers. This option is identical to typing win /d:m at the command line, as described in "Using WIN.COM Switches."

The Startup menu can include three to four Safe Mode options, depending on whether the computer is compressed or is part of a network. Each Safe Mode option disables a different portion of the startup process.

Safe Mode Command Prompt Only

Safe Mode Command Prompt Only loads the COMMAND.COM and DoubleSpace or DriveSpace (if present) files. It does not load HIMEM.SYS, IFSHLP.SYS, or Windows 95.

The following are examples of when to use Safe Mode Command Prompt Only:

- If Windows 95 fails to start, even with the Safe Mode option.
- If you want to use command-line switches (such as win /d:x).
- If you want to use command-line tools (such as editing CONFIG.SYS).
- If you want to avoid loading HIMEM.SYS or IFSHLP.SYS.

Safe Mode Without Compression

This option appears on the Startup menu only if the computer has a compressed drive. This option loads COMMAND.COM and does not load any compression drivers. The computer starts at the real-mode command prompt.

The following are examples of when to use Safe Mode Without Compression:

- If the computer stops responding when accessing a compressed drive.
- If a Corrupt compressed volume file (CVF) error occurs during system startup.
- If Windows 95 fails to start, and both Safe Mode (F5) and Safe Mode Command Prompt Only (Shift-F5) are unsuccessful.
- If you want to bypass compression drivers.

Safe Mode with Network Support

You can use the Safe Mode With Network Support option in networking environments in which users might require network connectivity to recover from a system problem. If the operating system starts with Safe Mode but not with Safe Mode with Networking, the network configuration probably requires further adjustment.

This option does not process CONFIG.SYS and AUTOEXEC.BAT but does load COMMAND.COM. It only processes AUTOEXEC.BAT if no Windows 95 version of MSDOS.SYS is present, or if the [Paths] section in MSDOS.SYS is invalid and no valid WinDir= entry is present.

If the [Paths] section and the WinDir= variable are not defined in MSDOS.SYS when you use this option, NETSTART.BAT does not run; only AUTOEXEC.BAT runs and Windows 95 fails to load.

Note: You cannot use Safe Mode with Network Support when the Registry is corrupted.

Most existing real-mode networks run from the startup files, and all Safe Mode options bypass these files. The NETSTART.BAT file in the Windows directory contains commands for starting Microsoft or NetWare networks. NETSTART.BAT allows Windows 95 to start most real-mode networks on individual computers without running AUTOEXEC.BAT and CONFIG.SYS.

Step-By-Step Confirmation

Step-By-Step Confirmation allows you to specify which commands and drivers the system should process by confirming each line of the startup files.

The following are examples of when to use Step-By-Step Confirmation:

- If the startup process fails during loading of the startup files.
- If any real-mode drivers must be loaded to run Windows 95 successfully.
- If you need to check for Registry failure messages.
- If you need to verify that the expected drivers are being loaded.
- If you need to temporarily disable a specific driver or set of drivers.
- If you need to check for errors in startup files.

When you choose to confirm system startup line by line, the following prompts appear. You can press Enter to confirm or Esc to skip that part of system startup.

- Load DoubleSpace (or DriveSpace) driver?
- Process the system Registry?
- Create a startup log file (BOOTLOG.TXT)?
- Process your startup device drivers (CONFIG.SYS)? Each line from CONFIG.SYS is displayed with the [Enter=Y,Esc=N] prompt. You can press tab when the first CONFIG.SYS prompt appears to automatically accept all options.
- Process your startup command file (AUTOEXEC.BAT)? Each line from AUTOEXEC.BAT is displayed with the [Enter=Y,Esc=N] prompt. You can press

Continued on page 448

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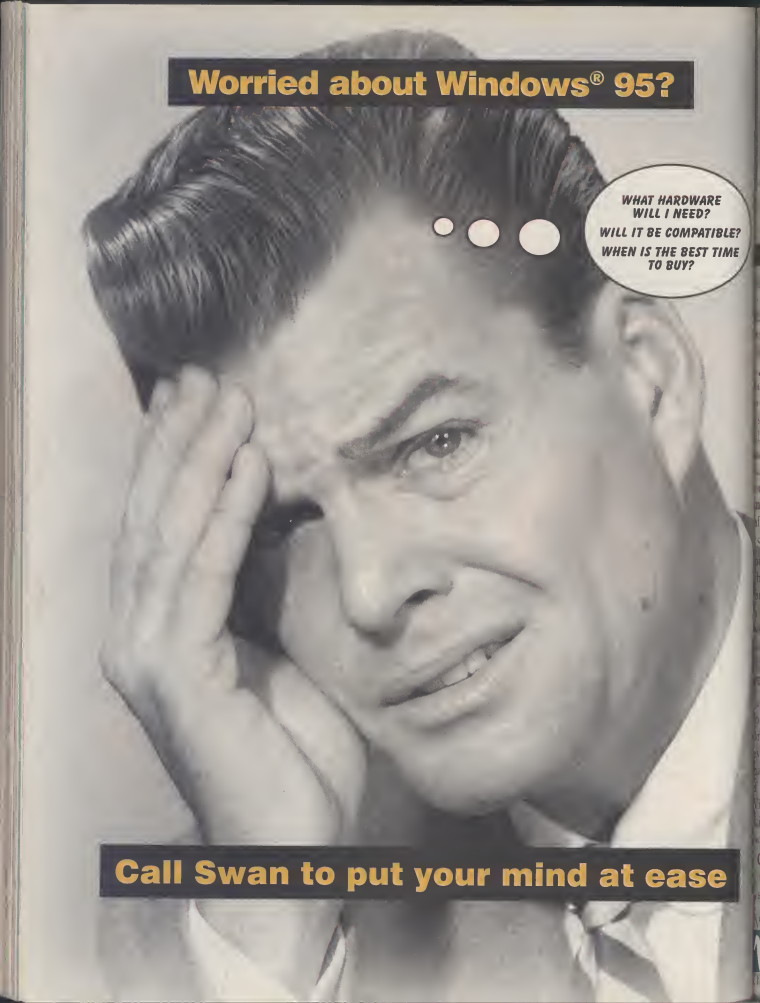


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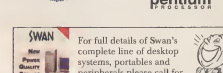
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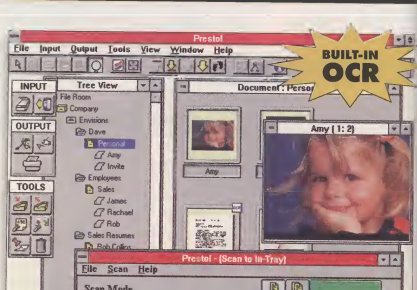
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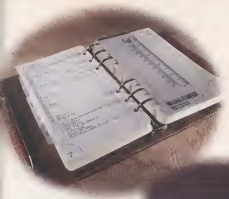
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Continued from page 442

tab when the first AUTOEXEC.BAT prompt appears to automatically accept all options.

- Run WIN.COM to start Windows 95?
- Load all Windows drivers?

If you press Enter to answer Yes to each prompt, the result is the same as starting Windows 95 normally except that the logo does not appear. Answering No to "Load All Windows Drivers?" runs Windows 95 in Safe Mode.

Using WIN.COM Switches

The following switches are available to start Windows 95 from the command prompt when you need to isolate an error condition:

```
win [/d:[f] [m] [n] [s] [v] [x]]
```

The /d: switch is used for troubleshooting when Windows 95 does not start correctly. The following switches can be used with the /d: switch.

- f Turn off 32-bit disk access. Try this if the computer appears to have disk problems or if Windows 95 stalls. This is equivalent to 32BitDiskAccess=FALSE in SYSTEM.INI.
- m Starts Windows 95 in Safe Mode.
- n Starts Windows 95 in Safe Mode with Networking.
- s Specifies that Windows 95 not use ROM address space between F000:0000 and 1MB for a break point. Try this if Windows 95 stalls during system startup. This is equivalent to SystemROMBreakPoint=FALSE in SYSTEM.INI.
- v Specifies that the ROM routine should handle interrupts from the hard disk controller. Try this if Windows 95 stalls during system startup or disk operations. This is equivalent to VirtualHDIRQ=FALSE in SYSTEM.INI.
- x Excludes all of the adapter area from the memory that Windows 95 scans to find unused space. This is equivalent to EMMExclude=A000-FFFF in SYSTEM.INI.

Troubleshooting Procedures

This section provides basic instructions for troubleshooting problems that may occur when running Windows 95.

Important: Create and keep a startup disk, and verify that it works before you need it. Always make backup copies of configuration files (especially SYSTEM.DAT and USER.DAT).

A particularly good time to back up files and update the startup disk is after you install new devices and applications, and when you have a good working configuration.

Checking Specific Driver Problems

Loading a specific driver in CONFIG.SYS, AUTOEXEC.BAT, or the Windows 95 Registry may cause a computer to stall. This could be due to a hardware or software (device driver or TSR) conflict.

To determine whether hardware or software is making the computer stall:

1. Press F8 at the Starting Windows 95 message and select Safe Mode Command Prompt Only. If this option prevents the computer from stalling on startup, a device driver or TSR is the likely cause of the problem. Restart the computer, press F8 again, and select the Step-By-Step Confirmation option to check for TSRs that are loading and may be causing the problem.
2. If you use disk compression and the computer still stalls after using Safe Mode Command Prompt Only to start, restart the computer in Safe Mode Without Compression by pressing Ctrl-F5 when the Starting Windows 95 message appears.
3. Check the CMOS settings in the computer's BIOS configuration menus, making sure the settings match your installed hardware.
4. Check the hardware installation and the manufacturer's documentation to verify that all devices are correctly installed.
5. Check resource settings in Device Manager for specific installed hardware to make sure no conflicts exist in the IRQ, I/O address, DMA channels, and memory addresses used. Compare your actual installation with the hardware documentation for inconsistencies in the settings. For information, see "Devices."

To check whether a specific driver is making the computer stall, restart the computer. Press F8 when the Starting Windows 95 message appears, and then select the Logged (BOOTLOG.TXT) option. Search the BOOTLOG.TXT file for errors. For information about this file, see "Setup Technical Discussion."

Removing Unnecessary Drivers

To determine which drivers should be removed so that they will not be loaded, first try to start the computer without these drivers before removing them from CONFIG.SYS and AUTOEXEC.BAT (and .BAT files called from the AUTOEXEC.BAT).

To determine which drivers can be removed, restart the computer, press F8 at the Starting Windows 95 message, and then select the Step-By-Step Confirmation option. Temporarily remove specific drivers or prevent TSRs from loading to determine whether the computer can run successfully without them.

Checking File Versions

You can view a file's properties to determine its version number and other information, such as when it was created. You can use this information to determine whether a DLL or other supporting file is out of date. Notice, however, that not all DLL files display this information.

To view information about a system file, in Windows Explorer, right-mouse click on the filename and then click on Properties in the context menu. For a supporting or executable file, click on the Version tab. Use the Other Version Information list to see details about the file.

Checking for Missing System Files

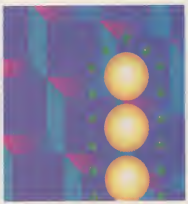
A missing operating system file prevents the startup process from continuing. If you are missing only the COMMAND.COM file, you can fix this problem from the Startup menu as described in Safe Mode Command Prompt Only, or from a startup disk.

This section also describes how to check and restore the IO.SYS and MSDOS.SYS system files. Windows 95 uses the same names for the real-mode operating system files as MS-DOS does (IO.SYS, MSDOS.SYS, and COMMAND.COM). However, to support dual boot, the MS-DOS versions of these files are renamed with a .DOS extension when you install or start Windows 95 after having started the computer with the previous operating system.

Here's how to replace or reinstall the real-mode operating system files:

1. Start the computer using the Windows 95 startup disk.
2. At the command prompt for the startup drive, type sys c: to copy IO.SYS, MSDOS.SYS, DRVSPACE.BIN, and COMMAND.COM to drive C. This

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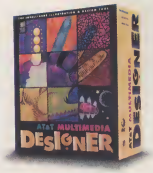




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Continued from page 448

rewrites the boot sector.

3. Remove the floppy disk and restart the computer.

If COMMAND.COM is missing, a message indicates this and prompts you to type the path for the file. To restore COMMAND.COM using command-line commands, insert the startup disk into the floppy disk drive. At the command prompt, type:

```
attrib -r -s -h c:\command.com
copy a:command.com c:\
```

If the Windows 95 MSDOS.SYS file is missing, a blue screen presents a message: "Invalid Vxd dynamic link call from IFSMGR (03)." This is followed by an error initializing IFSMGR, and startup fails.

Errors that appear during system startup related to the Registry, XMS, and IFSMGR, are all caused by invalid syntax in the specification of the [Paths] section of MSDOS.SYS or the WinDir= entry. Setting the WinDir= value causes IO.SYS to use that value to set the following environment variables:

- tmp=WinDir
- temp=WinDir
- path=WinDir;WinDir\command
- comspec=WinDir\command.com

If no valid WinDir= entry is found in MSDOS.SYS, the path defaults to C:\WINDOWS, and COMSPEC defaults to C:\COMMAND.COM.

If IO.SYS is missing, the computer stalls before the Starting Windows 95 message appears and displays a message. The message says that the system disk is invalid and prompts you to replace it. You must use a bootable Windows 95 disk (such as the startup disk) to start the computer. You will then need to reinstall the real-mode operating system files on drive C as described in the preceding procedure.

You can restore the COMMAND.COM. To restore COMMAND.COM using Windows Explorer, follow these instructions:

1. Restart the computer, press F8 at the Starting Windows 95 message, and then select the Safe Mode option.
2. Insert the startup disk into the startup drive.
3. Using My Computer or Windows Explorer, find COMMAND.COM on the floppy disk, and then drag the file from the floppy disk drive to the root directory of the boot drive.

Checking for Conflicts at System Startup

If a computer fails to start Windows 95, try the following:

1. Check for upper-memory-area conflicts. If you suspect an upper-memory conflict, use win /d:x to start Windows.
2. Check whether Safe Mode resolves the problem. To verify whether loading minimal drivers will resolve the problem, use F5 or win /d:m.
3. Check for conflict with 32-bit disk access. If you don't want to load 32-bit disk access, use win /d:f.
4. Check for hard disk I/O conflicts. If you want to force VirtualHDIRQ=Off, use win /d:v. For more information see Using WIN.COM Switches.
5. Check for and remove unnecessary drivers and TSRs, and retry.
6. Check for device conflicts by using Device Manager in the System option in Control Panel.
7. Check for an outdated or damaged VxD by examining the BOOTLOG.TXT, and then do the following:

• If it is in the Windows SYSTEM\IOSUBSYS directory, rename it.

• If it has a .386 filename extension, examine the [386Enh] section of SYSTEM.INI and remark out its lines. When renaming VxDs, be sure to change the .VXD extension. Windows 95 loads all files in the IOSUBSYS subdirectory that have a .VXD extension.

• If it is in VMM32.VXD, check the Windows SYSTEM\VMM32 directory for a VMM32 file, and rename or move it.

Checking for Free Disk Space

Running out of space on the disk drive used for TEMP and swap files can cause a variety of operational and installation errors. If you need more disk space, see the troubleshooting aid for disk space problems in online Help.

To check for free space at the command prompt:

1. Use the chkdsk drive command at the command prompt to display the available disk space in the "Bytes Available on Disk" line.
2. Use the dir drive command at the command prompt to view the bytes free at the end of the DIR display.
3. You might want to check the swap file settings. To do this, click on the Performance tab in the System option in Control Panel and then click on the Virtual Memory button.

For more information about troubleshooting memory problems, see Performance Tuning and online Help.

Important: By default, Windows manages the virtual memory settings. Changing these settings can adversely affect system performance. The recommended setting in this dialog box is meant to let Windows manage virtual memory settings.

To check for lost allocation units from a command line:

1. Press F8 when the Starting Windows 95 message appears and select the Safe Mode Command Prompt Only option.
2. Run ScanDisk from the Windows COMMAND directory. ScanDisk detects lost allocation units and prompts you to recover them.

To check the TEMP variable, follow these instructions:

1. At the command prompt, type set to display the TEMP variable.
2. Verify that the TEMP variable points to a valid drive and directory.

Check for free disk space on the drive that contains the TEMP directory. If you are printing multiple copies of a large document, or printing large PostScript documents, you should increase the minimum available free disk space.

Checking for Disk Corruption

Key operating system data structures prevent system startup if they are damaged. These structures include the master boot record, the boot sector, the file-allocation table, and the core operating system files.

Caution: Back up key data files before performing any disk repair operations.

Do not run any disk utilities that are not specifically designed for Windows 95. Earlier versions of disk-repair utilities may not work properly. To prevent possible data loss, use a disk utility that is specifically designed for Windows 95 for example, ScanDisk. (Or the Norton Disk Doctor, which is part of Symantec's Norton Utilities for Windows 95.—*Editor*)

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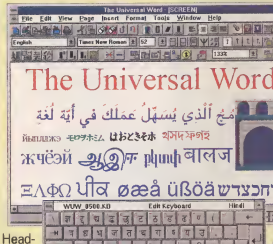
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SPEC WATCH **Network File Servers**

Are You Being Served?
It's not just any PC—it's your server. It has to connect the users and peripherals on your network reliably and quickly. It also has to give your network room to grow. Technical Director Adam Meyerson tells you what you need to know when choosing the ideal file server, plus details on why you need RAID and SCSI to keep your network running smoothly. 459



Spec Watch Before your next hardware investment, check out our recommended specs:

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Rave Review



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POWERFUL, EXPANDABLE, AND RELIABLE

File Servers: LAN Workhorses

Any computer running a network operating system is a server, right? Think again. Sure, there are lots of plain old PCs masquerading as servers, but under the constant stress of 20 users, a standard-issue PC crumbles like a Yugo in a demolition derby. Thus the common office announcement, "The server is down." The first step to keep yours running: Start with a real server.

Despite what you may think, in many cases you'll need less CPU power in your file server than in your desktop system. That's because only the network operating system—Novell's NetWare or Microsoft's Windows NT, for example—runs on the server. All the applications run on the workstations. A 66MHz 486DX2 provides plenty of horsepower for a 20-user network. If you expect more users or just want to plan for growth, then opt for a 75MHz or 90MHz Pentium. Long before the CPU holds you back, you'll feel I/O (disk and network card) constraints. The biggest factor here is the bus, and 32-bit EISA has long been the best choice. (As for local bus, PCI is the de facto standard. Your motherboard should support both EISA and PCI.)

To keep up with disk traffic, your server needs lots of RAM for caching and plenty of disk space. On networks with 20 users or fewer, you can get away with 16MB of RAM, but a larger group will require at least 32MB. Start with at least 2GB of disk space. For the ultimate in disk performance and protection from crashes, build a redundant array of inexpensive disks (RAID). The most common flavors are RAID-0, RAID-1, and RAID-5. RAID-0 is the fastest with no redundancy, RAID-1 is the most redundant but most costly, and RAID-5 offers the best of both. Make sure your RAID controller supports these three. A SCSI interface is also a natural for servers because it can access multiple drives simultaneously. Increase the number of drives in your server and balance the load among them for big performance gains. For a busy network (25 or more users), RAID can handle the load-balancing automatically and offer protection against a disk crash—the most common cause of server failure. ADAM MEYERSON

FILE SERVERS AVOID BOTTLENECKS IN HARD DISK AND RAM

A. Display: 14-inch capable of 640-by-480-pixel resolution.

B. CD-ROM Drive: Quad-speed.

C. RAM: 16MB minimum, expandable to 128MB.

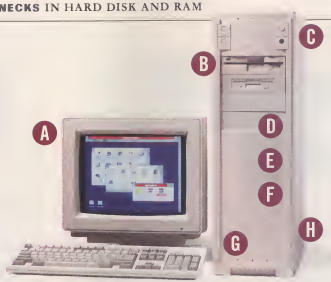
D. Secondary CPU Cache: 256K.

E. Video Card: 512K of RAM.

F. Hard Drive: 2GB SCSI-2.

G. CPU: 66MHz 486DX2, or 75MHz or 90MHZ Pentium.

H. Bus: Eight slots with a combination of EISA and PCI.



Features and Options: Server management software, RAID-5, wide SCSI-2, DAT backup, uninterruptible power supply, two half-height and two full-height 5.25-inch drive bays with front-panel access, locking cabinet, integrated SCSI controller, Ethernet controller, two COM ports, one parallel port, keyboard, and mouse.

Usability: Flash BIOS for easy upgrades, hot-swappable hard disks, upgradable CPU socket, easy access to SIMMs.

Windows 95 Considerations: For peer-to-peer networks you don't need a server. All you need are network cards—Ethernet for example—and the appropriate cabling. Client drivers include support for NetWare, Windows NT, Banyan VINES, and SunSoft.

Direct to You

SPEC WATCH: Don't Settle for Less Than These Specs

HIGH-END DESKTOP SYSTEMS



CPU: 90MHz to 133MHz Pentium.

RAM: 16MB.

Secondary CPU Cache: 256K.

Display: 17-inch, 1,024 by 768 at 72Hz or higher refresh rates.

Video Card: 64-bit PCI graphics accelerator, 2MB of VRAM or WRAM, 72Hz or higher refresh rates.

Hard Drive: 1GB.

Bus: Six slots including two PCI.

Features and Options: 16-bit Sound Blaster–compatible sound card, four available half-height 5.25-inch drive bays, 21-inch monitor, graphics accelerator with 4MB of RAM, six-speed CD-ROM drive.

Usability: Flash BIOS for easy upgrades, tool-free cover removal, upgradable CPU socket, easy access to SIMMs.

Windows 95 Considerations: A Plug and Play BIOS lets Windows 95 reconfigure motherboard resources if a conflict arises. Even without a Plug and Play BIOS, Windows 95 can detect resources and reconfigure a Plug and Play peripheral. Note that many Plug and Play BIOSs came out long before Windows 95. Check your BIOS date and upgrade it if a newer version is available.

ENTRY-LEVEL DESKTOP SYSTEMS



CPU: 66MHz 486DX2.

RAM: 8MB expandable to 32MB, 72-pin SIMMs.

Secondary CPU Cache: 256K.

Display: 15-inch, 800 by 600 at 72Hz or higher refresh rates.

Video Card: 64-bit graphics accelerator, 1MB of DRAM, 72Hz or higher refresh rates at all resolutions.

Hard Drive: 500MB EIDE.

Bus: Six slots including two PCI.

Features and Options: 16-bit Sound Blaster–compatible sound card, four available 5.25-inch drive bays, 2MB of memory on graphics accelerator.

Usability: Flash BIOS for easy upgrades, tool-free cover removal, upgradable CPU socket, easy access to SIMMs.

Windows 95 Considerations: A Plug and Play BIOS lets Windows 95 reconfigure motherboard resources if a conflict arises. Even without a Plug and Play BIOS, Windows 95 can detect resources and reconfigure a Plug and Play peripheral. Note that many Plug and Play BIOSs came out long before Windows 95. Check your BIOS date and upgrade it if a newer version is available.

GRAPHICS ACCELERATORS



Resolutions: 800 by 600 for 15-inch monitors; 1,024 by 768 for 17-inch; 1,280 by 1,024 for 20- and 21-inch.

Colors: 256 colors for business applications; 65,000 colors (or more) for near–photo-quality images.

Vertical Refresh Rates: 72Hz or higher at all resolutions.

RAM: 1MB of DRAM for 256 colors at 1,024 by 768; 2MB of VRAM or WRAM higher specs.

Features and Options: For Windows systems, a utility for switching resolutions and colors. VESA advanced feature connector (VAFC) or VESA media channel (VMC) feature connector.

Usability: Virtual desktop software utility.

Windows 95 Considerations: Plug and Play support lets Windows 95 automatically identify video cards and configure them. Even non–Plug and Play video cards may be identified, but must be reconfigured manually. Windows 95 has a utility for switching resolutions and color depth, and for power management. Plug and Play support in your video card is required to take advantage of Plug and Play monitors.

DESKTOP MONITORS



Size: 17-inch; 20- to 21-inch for CAD, desktop publishing, or graphics applications.

Resolutions: 1,024 by 768 for 17-inch; 1,280 by 1,024 for 20- and 21-inch; 1,600 by 1,280 for CAD and document imaging.

Dot Pitch: 0.28mm or smaller for 17-inch, 0.31mm or smaller for 20- and 21-inch.

Vertical Refresh Rate: 72Hz or higher at all resolutions.

Tube Type: Flat-square or Trinitron.

Features and Options: Support for MPR II low-emissions standards, compliance with EPA Energy Star requirements, ability to save settings for various resolutions and refresh rates.

Usability: Adjustable tilt-and-swivel base, antiglare coating, onscreen controls.

Windows 95 Considerations: Plug and Play support lets Windows 95 automatically identify a monitor (a Plug and Play graphics card is required) and select the proper video resolution.

CD-ROM DRIVES



Access Time: 200ms.

Transfer Rate: 600KBps (quad-speed drive).

Cache: 64K on drive.

Interface: EIDE or SCSI-2.

Compatibility: High Sierra and ISO-9660, CD-Audio and Kodak Photo CD (for still photography) with multisession support (MPC 2).

Audio: Output jack and volume control.

Features and Options: CD changer holding two or more CDs; six-speed.

Usability: No CD caddy required, double doors to keep out dust, external controls for audio CDs.

Windows 95 Considerations: For optimum performance, make sure that Windows 95 protected-mode drivers are available for your CD-ROM drive. CD-ROM drives with real-mode drivers offer poor performance under Windows 95.

SOUND CARDS



Compatibility: Sound Blaster.

Mode: Stereo.

Sampling Capability: 8- and 16-bit record and playback.

Maximum Sampling Rate: 44.1kHz.

Synthesizer: Wave-table or FM with Wave option.

Voices: 16 simultaneous in Sound Blaster mode, 24 in Roland.

Ports: Speaker, microphone, and joystick.

Features and Options: Programmable digital signal processor (DSP), SCSI or EIDE port for a CD-ROM drive, QSound Virtual Audio, microphone, headset, and powered speakers.

Usability: Software configurable (no jumpers), bundled software for speech-to-text and command control.

Windows 95 Considerations: Plug and Play support lets Windows 95 automatically identify sound cards and reconfigure them if necessary. In some cases, even non-Plug and Play sound cards may be identified, but they must be reconfigured manually.

HARD DISK DRIVES



Performance: 13ms or faster vendor-rated average access time. If vendor reports performance as average seek time, look for 10ms or faster.

Cache or Buffer: 256K.

Capacity: 500MB or greater.

Size: Half-height 3.5-inch for 1GB and smaller, half-height 5.25-inch for 1GB to 2GB, full-height 5.25-inch for 2GB and larger.

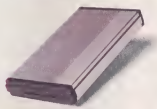
Interface: EIDE or SCSI-2.

Features and Options: Mounting rails, cables, minimum three-year warranty—minimum five-year warranty for 2GB and larger disks. Partitioning software, setup software for older BIOSs that don't support 1GB drives.

Usability: All jumpers labeled in English, documentation detailing jumper functions.

Windows 95 Considerations: Both IDE (Enhanced and standard) and SCSI-2 are well supported. Partition size is still limited to 2.1GB.

MODEMS



Transmission Rate: 14.4Kbps for small file downloads; 28.8Kbps for large file downloads, Internet access, and remote control/remote access.

Supported Standards: Data speed of V.32bis for 14.4Kbps, or V.34 for 28.8Kbps. Error correction of V.42; data compression of V.42bis; CCITT Group 3 Class 1, Class 2, and CAS (fax).

Compatibility: Hayes AT command set.

Features and Options: Integrated voice, data, and fax; onboard digital signal processor (DSP); 16550 UART on internal modems. For external modems, get a fast I/O card with the 16550 UART chip.

Usability: LCD readout on external models, Windows software with support for Zmodem, Ymodem, Xmodem, and Kermit. Built-in scripts for CompuServe and MCI. Support for calling cards. Software setup on internal modems (no jumpers).

Windows 95 Considerations: Windows can automatically detect most of today's modems without requiring any special features.

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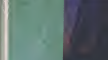
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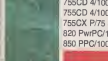
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MULTIMEDIA

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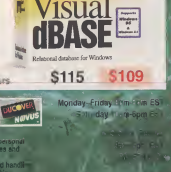
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More and more people are finding out that it doesn't take an Einstein to know Quantex is the right choice. Just ask **PC World** (6/95). They announced that Quantex burst "Out of the blue" with 70% growth last year. What's our formula? We work to exceed your expectations by giving you all the features you want and more in highly reliable, satisfaction guaranteed systems that are exceptionally priced.

You always get more bang for your buck with Quantex.

Quantex gives you the best overall value with more of the features you want most. As **Computer Shopper** (8/95) said of our QP5/100, we're "Generous in matching price to performance." And with many systems fully packed with 16MB RAM, huge 1.28GB Western Digital hard drives, the ATI MACH 64 video card, 17" MAG monitors, and 28,800 bps fax/modems, we include hardware the competition offers as extras.

For the ultimate multimedia experience, we've put together packages that will blow you away. The Toshiba Quad Speed CD-ROM features 190ms seek time, 600KB data transfer, and smooth multimedia performance to make your software come to life. And music lovers will appreciate the Ensoniq Wavetable sound card's full range of frequency, fully realized through the crisp highs, deep bass, and pure power of the Altec Lansing ACS-5 speakers. No one but Quantex gives you high performance multimedia like this for less.

Leading the pack with Microsoft Windows®95.



Some people think that to get a great price you have to sacrifice a position at the forefront of technology. Not us. We stay ahead with the most advanced features available. Enjoy all the advantages of the new Windows 95 operating system's speed and ease of use. Plus, Quantex is one of few companies to have passed Microsoft Hardware Compatibility Testing. That means that our systems are Plug & Play compliant, so adding new plug & play components is a snap!

Better software packages that put the competition's to shame.

Other companies will try to slip you lame CD's to try and fatten up their bundles. Not Quantex. We refuse to sacrifice quality...or quantity!

Professional Bundle: Specifically designed for the aggressively business minded, this bundle is a must-have, featuring over 24 of the absolute hottest business titles on the market today!

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COMPUTER SHOPPER "An Affordable and Affable P100....Generous in matching price to performance." (8/95)

Designed for Microsoft Windows 95

Intelligent Choice.

more, but also show off the colorful video, animation, and crystal clear sound that multimedia is all about!

Quantex makes customization easy and affordable.

We make it easy for you to get exactly the system you want with the upgrade options you want most at the lowest prices. The Microsoft Natural Keyboard is ergonomically shaped to give working fingers and wrists a break for an additional $59. And you can give your multimedia the bass boost of the plug & play ready Ensoniq Wavetable sound card and Altec Lansing ACS-31 speakers with subwoofer for an additional $99. Of course, there's plenty more options to choose from.

Your satisfaction is guaranteed.

Built with the highest-quality technology, all of our systems are rigorously tested until they're ready for shipment. Our customers love us so much for it that they put it in writing. In PC WORLD's June '95 reader's poll, our customers rewarded us with ☆☆☆☆ for "High Customer Satisfaction" and said they would be far more likely to buy another Quantex than any other system. It's no wonder: we *guarantee* your satisfaction with our 30-Day Money Back policy! Plus, you get One-Year Free Parts Replacement, One Year Free On-Site Service, a lifetime of Toll-Free Technical Support, and the option of 3 additional years of service with the GE Support Plus Plan. Give one of our representatives a call today, and be the next to make the most intelligent choice!



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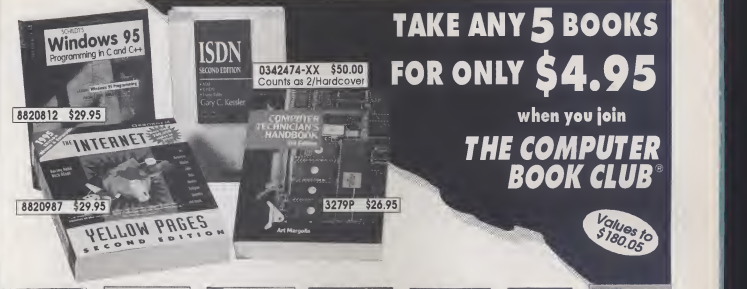
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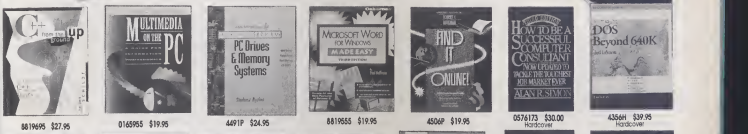
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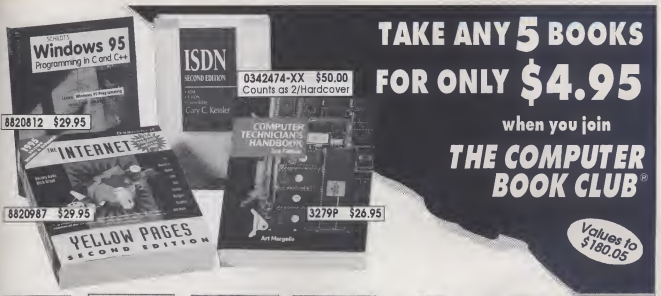
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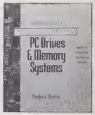
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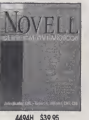

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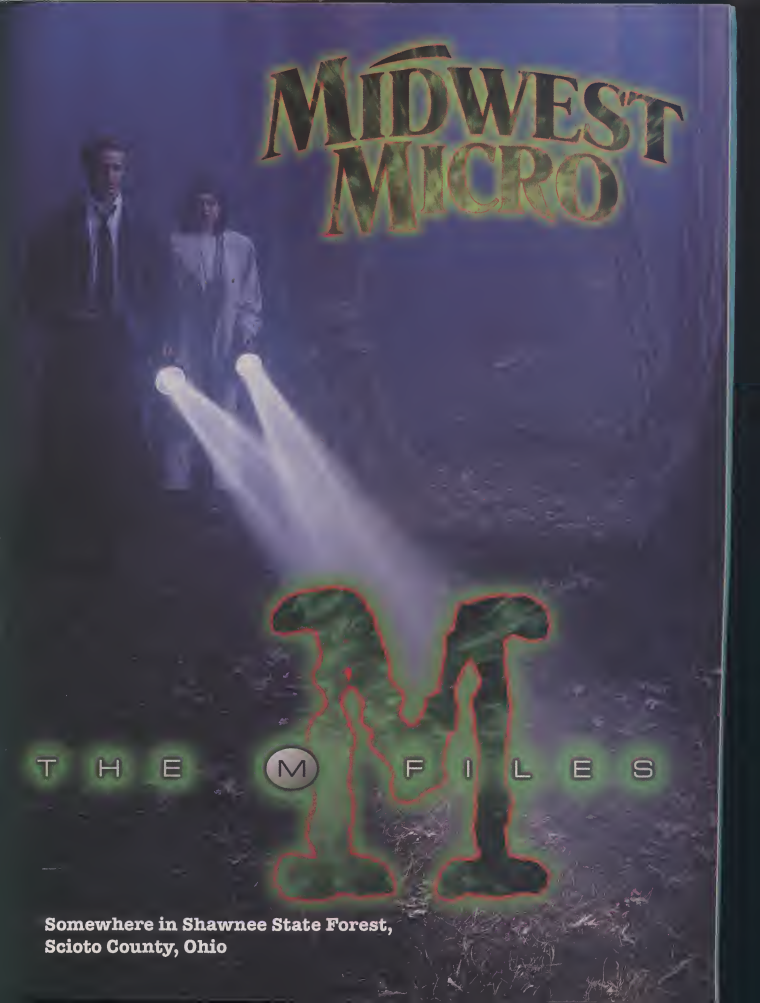
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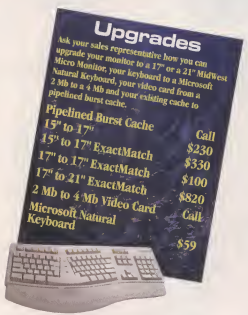
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- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta 95, Works, Money, Scenes, Dangerous Creatures & Golf
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 28.8 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .28 Digital Color Monitor with MPR II
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS Windows 95
- The Real 3 Year Warranty

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THE REAL 3 YEAR WARRANTY

intel inside

MidWest Micro Office PCs

P5-100 — $1999
#009486
- Intel 100 MHz Pentium Processor
- Intel Triton Chipset
- 8 Mb High Performance EDO RAM
- 850 Mb IDE Hard Drive
- PCI Fast IDE Interface
- 64-Bit PCI Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor with MPR II
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS Windows 95
- MS Office Professional, Bookshelf® & Encarta 95
- Free MS Office 95 Upgrade
- The Real 3 Year Warranty

P5-90 — $1899
#009487

P5-75 — $1799
#009488

P5-133 — $2999
#009491
- Intel 133 MHz Pentium Processor
- Intel Triton Chipset
- 16 Mb High Performance EDO RAM
- 256 Kb Pipeline Burst Cache
- 1.2 Gb IDE Hard Drive
- PCI Fast IDE Interface
- ATI MACH 64 PCI Accelerator with 2 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" .28 Digital Color Monitor with MPR II
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Microsoft Natural Keyboard™
- Microsoft Mouse
- MS Windows 95
- MS Office Professional, Bookshelf & Encarta 95
- Free MS Office 95 Upgrade
- The Real 3 Year Warranty

P5-120 — $2899
#009492

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- Built-in Stereo Speakers & Microphone
- External Jacks for Line In & Line Out
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- Two Type II/One Type III PCMCIA Slots
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- NiMH Battery & AC Adapter
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- Microsoft® Works for Windows 3.0 & Golf
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- Carrying Case
- The Real 3 Year Warranty

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DX4-75 with 340 Mb HDD
#008141 — **$1899**

Active-Matrix Color
DX4-100 with 520 Mb HDD & 16 Mb of RAM
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AD#M10

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System Downloaded	Higher Score Represents Faster Performance	Ziff-Davis WinBench 95
MidWest Micro P5-100 Office PC		**925**
Micron P100 Millennia		887
Gateway P5-100XL		788
ZEOS Pantera Pentium-100		759
USA Flex PT-100 Tower System		744

Source: PC Magazine "Beyond the Promise of the Pentiums – May 30, 1995"

MAGAZINE EDITORS' CHOICE
May 30, 1995

CD-ROM DRIVES

MicroSolutions

backpack Double Speed, external	005981	$289
backpack Double MicroSolutions		
Speed w/Sound, external	007289	379
backpack Dual Speed, external	003982	369
backpack Dual Speed w/Sound, external	007290	459

Panasonic

Double Speed, internal Panasonic	003749	$179
Portable Double Speed PLEXTOR	003726	319

Plextor

4Plex Dual Speed, internal	006721	$419
4Plex Dual Speed w/SCSI-2 Board, internal	006722	475
6Plex Dual Speed, internal	006732	499
6Plex Six Speed w/SCSI-2 Board, internal	006733	919

Sony

2X Portable Discman SONY.	005431	$395
4X w/4C, internal	005433	225

FAX MODEMS

Boca

14.4 V.32bis, external BOCA	002947	$105
14.4 V.32bis, internal	002945	79
14.4 Kbps w/VoiceView, external	005211	125
28.8 V.34, external	002469	219
28.8 V.34, internal	002484	169
SoundExchange in 14.4 WSp Voice, external	002164	169

Intel

14.4 Kbps, external IntelSet	004765	$85
14.4 Kbps, internal	004766	69
14.4 Kbps w/Voicemail, external	003769	95
14.4 Kbps w/Voicemail, internal	005566	79
14.4 Kbps w/Voicemail and Speakerphone, external	002520	119
28.8 Kbps PCMCIA	003952	219
28.8 Kbps w/Voicemail, internal	005252	159
28.8 Kbps w/Voicemail and Speakerphone, internal	002249	199
28.8 Kbps V.34, external	003185	249
28.8 Kbps V.34, internal	005563	199

Megahertz

14.4 XJACK PCMCIA Megahertz	005180	$159
14.4 XJACK Fax PCMCIA	005181	229
14.4 Fax Modem/PCMCIA, Ethernet Adapter	005197	349
28.8 PCMCIA	003706	339
28.8 XJACK PCMCIA	003704	329

U.S. Robotics

Sportster 14,400 PCMCIA U.S.Robotics	003368	$179
Sportster 14,400 V.42bis, external	003697	115
Sportster 14,400 V.42bis, internal	003695	95
Sportster 28,800 V.34, external	003699	209
Sportster 28,800 V.34, internal	003916	189
Sportster 28,800 V.34 PCMCIA	003697	329
Sportster 33,600, external	003537	85
Sportster 33,600, internal	003536	69

HARD DRIVES

Maxtor

425 Mb	004440	$159
540 Mb	004469	169
850 Mb	004515	215
1 Gb	004793	295
1.2 Gb	004928	275
1.6 Gb	005252	429

MONITORS

MAG

DX15F	004242	$365
DX17F	004231	699
LX1460LD	004228	249
MX913F	004282	815
MX21F	004388	1665

NEC

MultiSync XV15	004664	$535
MultiSync XS17	004645	985
MultiSync XV21	004654	1795
MultiSync XV14	002165	309
MultiSync XV15	004424	429
MultiSync XV17	003866	745

Princeton Graphics

Ultra 14	000130	$195
Ultra 14n	004151	215
Ultra 15	006152	335
Ultra 17	006153	599

Samsung

SyncMaster 3Nx	002854	$249
SyncMaster 15Gs	005273	499
SyncMaster 17Gls	005275	829
SyncMaster 17Gls	005272	885
SyncMaster 20Gs	005274	1325

Sony

Multiscan 15sf1	004742	$479
Multiscan 17se1	004743	1149
Multiscan 20se1	004744	1995
Trinitron CPD-1425	004947	335

ViewSonic

V14ES	003598	$275
V15GA	002137	499
V15GS	002139	479
V17	004132	829
V17GA	005739	635
V17GS	005738	615
V20FS	004905	1299
V21FS	004906	1669

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ACS32 Speakers	006713	85
ACS53 Speakers	006714	129
ACS300 1 Speakers	006704	299

Aztech

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Sound Blaster AWE32 Value Edition Sound Card	005401	155
Sound Blaster CT-38 Speakers	005613	29
Sound Blaster Digital SchoolMouse Multimedia Kit	005503	225
Sound Blaster Discovery CD 4x Multimedia Kit	005935	345
Sound Blaster Discovery CD New Edition Multimedia Kit	005604	375
Sound Blaster Home 4x Multimedia Kits	005606	455
Sound Blaster SB3200 Speakers	005605	99
Sound Blaster Value CD Multimedia Kit	005620	189

Labtec

CS-150 Speakers Labtec	005100	$16.75
CS-180 Speakers	005101	21
CS-250 Speakers	005154	34

Media Vision

MV-3200 Quad-Speed Multimedia Kit MEDIA VISION	006964	$289
Pro Sonic 16 SCSI Sound Card	006958	89

Panasonic

EA8401P Speakers Panasonic	001406	$45
EA8710P Speakers	001407	89

NETWORKING

3COM

EtherLink III Combo Adapter 3Com	006770	$119
EtherLink III Combo Adapter, 5 pack	006771	525
EtherLink 10/100 BASE-T Adapter	006772	299
EtherLink 10/100 BASE-T Adapter, 5 pack	006773	1115
LinkBuilder FMS 12-Port Hub	006774	539
LinkBuilder FMS 24-Port Hub	006775	1059

Artisoft

AirSynch Network Starter Kit ARTISOFT	007180	$229
LANtastic v6.0 Software, 1 user	007181	79
LANtastic v6.0 Software, 5 user	007182	379

Boca

10 BASE-T Concentrator BOCALAN/Card 2000+	002182	$125
Combo Adapter BOCALAN/Card 2000+ Combo Adapter, 5 pack	005308	69
BOCALAN/Card 2000T Adapter	005244	299
BOCALAN/Card 2000T Adapter, 5 pack	005243	275

Intel

EtherExpress Pro/10 Adapter, 10Base-T/BNC/AUI intel	002167	$128
EtherExpress Pro/100 PCI Adapter	005164	249
EtherExpress XL Printer Server, BNC	002129	465

Megahertz

10 BASE-T PCMCIA Ethernet Combo PCMCIA Adapter Megahertz	005189	$149
Ethernet Combo PCMCIA Adapter	005190	179

PRINTERS

Brother

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HL-660	004676	679
HL-760	003486	999
MFC-4500ML	003468	969

Epson

EL-30	003918	$255
EL-400	002062	1195
EL-2000ex	003897	195
ELC-7P	003019	349
ELC-4000	003871	249
LBP-430W	003917	439

Epson

ActionLaser 1100	003867	$369
ActionLaser 1400	003871	499
LD-300 EPSON	002376	165
LD-810	002089	269
LD-1070+	002090	415
LX-300	001575	179
Stylus Color	001936	525

Lexmark

2380 Plus Fonts LEXMARK.	001946	$325
2390 Plus Fonts	002332	349
ExecJet IIc	001982	265
Optra R	003815	1449
Optra Rx	003805	2525
WinWriter 600	001941	345

Okidata

ML320	006092	$99
ML321	006093	415
ML380	006094	359
ML521	006095	479
ML590 OKIDATA	006096	419
ML591	006097	565
OL400e	006090	405
OL410e	004091	525
OL416ex/PS	002377	749

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KX-P1150	001672	$125
KX-P1123	001659	179
KX-P1150	001776	199
KX-P2135	001848	245
KX-P3626	003845	299
KX-P4400	001659	439
KX-P4430	001835	599
KX-P5400	001788	475

Hewlett Packard

DeskJet 320	004915	$305
DeskJet 540 HEWLETT PACKARD	004916	219
DeskJet 660C	004917	299
DeskJet 1200C	004937	999

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Back-UPS 650 APC	002736	175
Back-UPS 800	001866	238
NiTE Surgearrest	002191	29
NET7 Surgearrest w/TEL	002192	45
Smart-UPS 700	004643	549
Smart-UPS v/s 650	004645	295

Tripp Lite

Isobar 4	001032	$36
Isotel 4 TRIPP LITE	001165	49
BC Personal 280	003296	79
BC Personal 420	005397	135
BC Personal 500	005398	169
BC Pro 450 Network UPS	005399	545
BC Pro 550 Network UPS	003401	695
TR-6 Super Surge Arrest	003783	29

SCANNERS

Canon

IX-3010 CANON	002718	$299
IX-4015	003069	725

Epson

ES-1000C EPSON	005263	$735
ES-1200C	003870	909
ES-1600C Pro	003872	1299

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MS Access 2.0, CD-ROM	007591	429
MS Office Professional 4.3, 3.5"	007592	919
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MS Office Professional 4.3 & Bookshelf Upgrade, CD-ROM	007597	329.50
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MS Project 4.0, 3.5" Microsoft	007556	479
MS Excel 5.0, 3.5"	007590	279
MS Visio Type Pack, 3.5"	007554	45
MS Word 6.0, 3.5"	007559	279
MS Word 6.0 & Bookshelf, CD-ROM	007560	429

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MS Flight Simulator 5.1, CD-ROM	007588	42
MS Golf 2.0, 3.5"	007575	42
MS Golf Multimedia 1.0, CD-ROM	007576	42

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MS Works 3.0 Money, 3.5"	007578	83
MS Works 3.0 Money, CD-ROM	007580	83

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MS Publisher 2.0, 3.5"	007581	94
MS Publisher 2.0, CD-ROM	007582	94
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MS Fine Artist, 3.5"	007577	31.50

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MS Ancient Lands 1.0, CD-ROM	007587	52
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MS Automap Road Atlas 4.0, 3.5"	007591	35
MS Automap Road Atlas 4.0, CD-ROM	007592	35
MS Dangerous Creatures 1.0, CD-ROM	007572	52
MS Dinosaurs, CD-ROM	007573	51
MS Explorapedia World of People, CD-ROM	007586	29
MS Explorapedia Nature 1.0, CD-ROM	007584	29
MS Magic School Bus Explores the Human Body, CD-ROM	007584	43.50
MS Magic School Bus Explores the Solar System, CD-ROM	007585	42.50

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MS Bob 1.0, CD-ROM	007569	84
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Jumbo 250, external	006937	275
Jumbo 250, internal	006936	139
Jumbo 700, external COLORADO	006933	339
Jumbo 700, internal MEMORY SYSTEMS	006935	209
Jumbo 1400, external	004903	289
Power Tape 1100, external	006926	815
Power Tape 1400, external	006908	535
Power Tape 4000, internal	006910	1125

Iomega

Ditto 430, external	009704	$225
Ditto 420, internal	009703	115
Ditto 800 Travan, external	009706	365
Ditto 800 Travan, internal	009705	199
Ditto 2200 Travan, external	009708	409
Ditto 3200 Travan, internal	009707	299

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backpack 250/340 Mb, external	005899	$299
backpack 800 Mb Travan, external	005863	285

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GRAPHICS PRO TURBO PCI, 2 Mb	004488	$339
GRAPHICS PRO TURBO VLB, 2 Mb	004487	299
GRAPHICS XPRESSION ISA, 2 Mb	004489	199
GRAPHICS XPRESSION PCI, 1 Mb	004491	155
GRAPHICS XPRESSION VLB, 1 Mb	004438	195
VIDEO-IT! ISA Capture Card	004951	245
VIDEO-IT! VLB Capture Card	004952	245

Boca

Basic ISA, 256K	002016	$45
SuperVGA ISA, 512K	001651	50
SuperVGA ISA, 1 Mb	002167	108
WinGine 64 PCI, 2 Mb	005218	160

Diamond

SpeedStar Pro ISA, 1 Mb	002825	$89
Stealth 64 VLB, 2 Mb	005219	249
Stealth 64 VLB, 2 Mb DIAMOND	005220	139
Viper Pro PCI, 4 Mb VRAM	004796	565

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1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

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	INT	EXT
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2.1GB	SCSI	3.5
3.2GB	SCSI	3.5
4.3GB	SCSI	3.5
4.3GB	SCSI	5.25
9.1GB	SCSI	5.25

IBM STANDARD

	INT	EXT
270MB	12MS	SCSI
514MB	12MS	SCSI
1.0GB	12MS	SCSI
2.1GB	12MS	SCSI
4.3GB	12MS	SCSI

Seagate

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
210MB	IDE	3.5
340MB	IDE	3.5
420MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

FACTORY NEW 5 YEAR WARRANTY

	INT	EXT
1.0GB	SCSI	3.5
2.1GB	SCSI	3.5
4.2GB	SCSI	3.5
4.3GB	SCSI	3.5
4.3GB	SCSI	5.25
9.1GB	SCSI	5.25

Maxtor

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
340MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

FACTORY NEW 5 YEAR WARRANTY

	INT	EXT
1.0GB	SCSI	3.5
2.1GB	SCSI	3.5
4.2GB	SCSI	3.5
4.3GB	SCSI	3.5
4.3GB	SCSI	5.25
9.1GB	SCSI	5.25

CONNER

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
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540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

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M2623	5.0MS	2.1GB
M2622	5.0MS	4.2GB
M2512	5.0MS	4.3GB
M2512	5.0MS	9.1GB

NETWORK HARD DRIVES

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	INT	EXT
340MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

IBM

	INT	EXT
340MB	IDE	3.5

Seagate

	INT	EXT
1.2GB	IDE	3.5
2.1GB	IDE	3.5

Quantum

	INT	EXT
540MB	12MS	3.5
1.0GB	12MS	3.5
1.2GB	12MS	3.5
2.1GB	12MS	3.5

CONNER

	INT	EXT
340MB	12MS	3.5
540MB	12MS	3.5

FUJITSU

	INT	EXT
1.2GB	12MS	3.5

SAMSUNG

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
340MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

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300 AUTOLOADER	8MM/20GB

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180MB	70
270MB	70
360MB	70

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IBM STANDARD

	INT	EXT
270MB	12MS	SCSI
514MB	12MS	SCSI
1.0GB	12MS	SCSI
2.1GB	12MS	SCSI
4.3GB	12MS	SCSI

Seagate

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
210MB	IDE	3.5
340MB	IDE	3.5
420MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

FACTORY NEW 5 YEAR WARRANTY

	INT	EXT
1.0GB	SCSI	3.5
2.1GB	SCSI	3.5
4.2GB	SCSI	3.5
4.3GB	SCSI	3.5
4.3GB	SCSI	5.25
9.1GB	SCSI	5.25

WESTERN DIGITAL

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
WD2360	500MB	11MS IDE
WD2420	1.0GB	11MS IDE
WD2540	1.2GB	11MS IDE

FUJITSU

FACTORY NEW 5 YEAR WARRANTY

	INT	EXT
M2624	5.0MS	1.0GB
M2623	5.0MS	2.1GB
M2622	5.0MS	4.2GB
M2512	5.0MS	4.3GB
M2512	5.0MS	9.1GB

SAMSUNG

FACTORY NEW 3 YEAR WARRANTY

	INT	EXT
340MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

REMOVABLES/OPTICALS

SYQUEST

REMOVABLE CARTRIDGE DRIVES

- 270MB INTERNAL IDE DRIVE
- 270MB EXTERNAL DRIVE
- 270MB CART. SINGLE/PACK
- 105MB CARTS
- 44MB/88MB/105MB/200MB CARTS

FUJITSU

REMOVABLE EXTERNAL OPTICAL DRIVES

- 128MB CARTRIDGE
- 230MB CARTRIDGE
- 600MB CARTRIDGE
- 1.3GB CARTRIDGE

FLOPPY DRIVES

TEAC

1.44MB	$39
2.88MB	$239

MicroSolutions

BACKPACKS

- Backup Internal/Parallel Port CD-ROM/DRIVE $399
- Dual SCSI/PARALLEL PORT CD ROM DRIVE $399
- Dual SCSI/PARALLEL PORT $299
- BACKPACK 250MB TAPE DRIVE $399
- BACKPACK 800MB TAPE DRIVE $599
- BACKPACK 1.6GB TAPE DRIVE $799
- BACKPACK REMAIN HARD DRIVE $79

MEGA

Zip drive 100MB	CALL/$199
Zip drive 100MB SCSI Interface	CALL/$99
Jaz drive 1GB	CALL/$599
Removable 88 MB	$149
Removable 105 MB	$169
Removable 200MB Internal	$249
Removable 200MB Insider SCSI	$279
Removable 200MB External SCSI	$299

CONNER

Tape4000 4GB Internal	$179
Tape4000 4GB External	$229
Tape4000 8GB Internal	$279
Tape4000 8GB External	$329
4203Y Tape 420MB Internal	$99
4203Y Tape 420MB External	$129
4320Y Tape 2GB up to 7MB/min	$479
4320Y Tape 2GB Internal Fast SCSI	$429
4320Y Tape 4GB up to 7MB/min	$599
4320Y Tape 4GB w/comp IMB Cache	$699

DIAMOND

SpeedStar Pro 1MB ISA 16	$49
SpeedStar Pro 1MB VLB 16	$59
SpeedStar Pro 1MB PCI 16	$69

HEWLETT PACKARD

FACTORY NEW-3 YEAR WARRANTY INT EXT

1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

Quantum

FACTORY NEW-3 YEAR WARRANTY INT EXT

PANTHER 540 S ECO-Z SERIES	IDE	3.5
PANTHER 1080 S ECO-Z SERIES	IDE	3.5

FACTORY NEW-5 YEAR WARRANTY INT EXT

LIGHTNING 730 S ECO-Z SERIES	SCSI	3.5
LIGHTNING 1080 S ECO-Z SERIES	SCSI	3.5

MICROPOLIS

FACTORY NEW-5 YEAR WARRANTY INT EXT

4221 AP	SCSI	3.5
4221 WS	SCSI	3.5
4320 AP	SCSI	3.5
4320 WS	SCSI	3.5
4550 AP	SCSI	3.5
4550 WS	SCSI	3.5

Seagate

FACTORY NEW-5 YEAR WARRANTY INT EXT

TRAIL BLAZER 2GB FAST	SCSI	3.5
TRAIL BLAZER 4GB FAST	SCSI	3.5
THUNDERBOLT SERIES	SCSI	3.5
FIREBALL 540 ECO-Z SERIES	IDE	3.5
FIREBALL 1080 ECO-Z SERIES	IDE	3.5
EMPIRE FAST ECO-Z SERIES	IDE	3.5
CAMPUS FAST ECO-Z SERIES	IDE	3.5
ATLAS FAST ECO-Z SERIES	IDE	3.5
ELITE 9	SCSI	5.25
GRAND PRIX SCSI-2 SERIES	SCSI	3.5
GRAND PRIX SCSI-2 SERIES	SCSI	5.25

WESTERN DIGITAL

FACTORY NEW-3 YEAR WARRANTY INT EXT

WD2360	500MB	11MS IDE
WD2420	1.0GB	11MS IDE
WD2540	1.2GB	11MS IDE

FUJITSU

FACTORY NEW-5 YEAR WARRANTY INT EXT

M2624	5.0MS	1.0GB
M2623	5.0MS	2.1GB
M2622	5.0MS	4.2GB
M2512	5.0MS	4.3GB
M2512	5.0MS	9.1GB

SAMSUNG

FACTORY NEW-3 YEAR WARRANTY INT EXT

340MB	IDE	3.5
540MB	IDE	3.5
1.0GB	IDE	3.5
1.2GB	IDE	3.5
2.1GB	IDE	3.5

MEMORY BEST BUY! 1995 SIMMS

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30 PIN PARITY/9-BIT

1MB 1 X 9-70NS SIMM 2 CHIP	$19
1MB 1 X 9-70NS SIMM 2 CHIP	$19
1MB 1 X 9-80NS SIMM 2 CHIP	$19
1MB 1 X 9-80NS SIMM 4 CHIP	$19
1MB 1 X 9-70NS SIMM 4 CHIP	$19
1MB 1 X 9-100NS SIMM 4 CHIP	$19
1MB 1 X 9-100NS SIMM 8 CHIP	$19
4MB 4 X 9-70NS SIMM 8 CHIP	$69
4MB 4 X 9-70NS SIMM 16 CHIP	$69
4MB 4 X 9-80NS SIMM 8 CHIP	$69
4MB 4 X 9-80NS SIMM 16 CHIP	$69
4MB 4 X 9-100NS SIMM 8 CHIP	$69
4MB 4 X 9-100NS SIMM 16 CHIP	$69
16MB 16 X 9-70NS SIMM	$69
16MB 16 X 9-80NS SIMM	$69
16MB 16 X 9-100NS SIMM	$69
256K 4 X 9-70NS SIMM	$5
256K 4 X 9-80NS SIMM	$5
256K 4 X 9-100NS SIMM	$5

30 PIN PARITY/9-BIT

1MB 1 X 9-80NS SIMM	$19
1MB 1 X 9-70NS SIMM	$19
4MB 4 X 9-100NS SIMM	$45
1MB 1 X 9-100NS SIMM	$19
4MB 4 X 9-70NS SIMM	$69
4MB 4 X 9-80NS SIMM	$69
4MB 4 X 9-100NS SIMM	$69
16MB 16 X 9-70NS SIMM	$69
16MB 16 X 9-80NS SIMM	$69
16MB 16 X 9-100NS SIMM	$69
256K 4 X 9-70NS SIMM	$5
256K 4 X 9-80NS SIMM	$5
256K 4 X 9-100NS SIMM	$5

30 PIN 9 BIT SIPP

1MB 1 X 9-70NS SIPP	$9
1MB 1 X 9-80NS SIPP	$9
1MB 1 X 9-100NS SIPP	$9
4MB 4 X 9-70NS SIPP	$31
256K 4 X 9-SIMM SIPP	$5

72 PIN/36 PARITY

256X36-1MB-70NS	$5
512X36-2MB-70NS	$9
1X36-4MB-70NS-NON MAJOR	195/175
1X36-4MB-70NS-MAJOR	179/159
2X36-8MB-70NS-NON MAJOR	370/350
2X36-8MB-70NS-MAJOR	350/330
4X36-16MB-70NS-NON MAJOR	745/725
4X36-16MB-70NS-MAJOR	725/705
8X36-32MB-70NS-NON MAJOR	1495/1475
8X36-32MB-70NS-MAJOR	1475/1455
16X36-64MB-70NS-NON MAJOR	3000/2980
16X36-64MB-70NS-MAJOR	2980/2960

EDO MEMORY

4MB/1Mx36 EDO	190/170
8MB/2Mx36 EDO	370/350

72 PIN/32 BIT NON PARITY

4MB/1Mx32-70NS-NON MAJOR	155/135
4MB/1Mx32-70NS-MAJOR	135/115
8MB/2Mx32-70NS-NON MAJOR	285/265
8MB/2Mx32-70NS-MAJOR	265/245
16MB/4Mx32-70NS-NON MAJOR	512/532
16MB/4Mx32-70NS-MAJOR	532/512

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WIDE SCSI HARD DRIVES

CONNER

FACTORY NEW 5 YEAR WARRANTY

4.3GB	SCSI	3.5

Seagate

FACTORY NEW 5 YEAR WARRANTY

4.3GB	SCSI	3.5
9.1GB	SCSI	3.5

MICROPOLIS

FACTORY NEW 5 YEAR WARRANTY

4.3GB	SCSI	3.5
9.1GB	SCSI	3.5

EXT. SCSI CASES

NEC

VERSA E, 3½" REMOVABLE LAPTOP DRIVES	$295
340MB	$295
524MB	$395
710MB	$795
810MB	$1095
1.2GB	$1695

IBM THINKPAD 700, 720

340MB	$599
524MB	$699
710MB	$1295
810MB	$1495
1.2GB	$1695

THINKPAD 701

340MB	$945
720MB	$1195

CD ROMS

SANYO

CDR-S2 DOUBLE SPEED CADDY	$249
CDR-S2 DOUBLE SPEED SLOT	$249

PLEXTOR

PX-63CS 6 Speed w/ Caddy	$499
PX-63CS 6 Speed w/ Slot Load	$499
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PX-43CS 4 Speed w/ Slot Load	$299

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CRMC FX400D 4 Speed IDE	$199/$229

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CD 55E 4 Speed IDE	$249
CD 510E Speed IDE	$299
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HARD DRIVE EXTERNAL CABLES

- 50 PIN HD CENTRONICS TO HD CENTRONICS
- 50 PIN HD CENTRONICS TO 50 PIN MICRO D
- 50 PIN MICRO D TO 50 PIN MICRO D
- 50 PIN HD CENTRONICS TO 25 PIN D

HARD DRIVE INTERNAL CABLES

- 50 PIN RIBBON TO 50 PIN MICRO D
- 50 PIN RIBBON TO 50 PIN HD CENTRONICS
- 50 PIN RIBBON TO 50 PIN RIBBON

MODEMS

Robotics

Sportster 28.8 V.34	$249
Sportster 28.8 V.34 Fax	$299
Sportster 28.8 V.34 W/SRAM	$299
Sportster 14.4 V.32 bis	$149
Sportster 14.4 V.32 bis Fax	$199
Sportster 14.4 V.32 bis W/SRAM	$199
Courier Dual Std V.34	$499
Courier Dual Std V.34 Fax	$549
Courier Dual Std V.34 W/SRAM	$549
Courier Dual Std V.34 Fax W/SRAM	$599

intel

SatisFAXtion 200 SE	$199
SatisFAXtion 400 SE	$249

NEC

VERSA E, 3½" REMOVABLE LAPTOP DRIVES	
340MB	$295
524MB	$395
710MB	$795
810MB	$1095
1.2GB	$1695

IBM THINKPAD 700, 720

340MB	$599
524MB	$699
710MB	$1295
810MB	$1495
1.2GB	$1695

THINKPAD 701

340MB	$945
720MB	$1195

CD ROMS

SANYO

CDR-S2 DOUBLE SPEED CADDY	$249
CDR-S2 DOUBLE SPEED SLOT	$249

PLEXTOR

PX-63CS 6 Speed w/ Caddy	$499
PX-63CS 6 Speed w/ Slot Load	$499
PX-43CS 4 Speed w/ Caddy	$299
PX-43CS 4 Speed w/ Slot Load	$299

MITSUMI

CRMC FX400D 4 Speed IDE	$199/$229

SONY

CD 55E 4 Speed IDE	$249
CD 510E Speed IDE	$299
CD 561E 6 Speed IDE	$349

TOSHIBA

CD 3401B 4 Speed IDE	$249
CD 3501B 6 Speed IDE	$349

TEAC

CD 56E 6 Speed IDE	$349

SCSI-IDE CABLES

HARD DRIVE EXTERNAL CABLES

- 50 PIN HD CENTRONICS TO HD CENTRONICS
- 50 PIN HD CENTRONICS TO 50 PIN MICRO D
- 50 PIN MICRO D TO 50 PIN MICRO D
- 50 PIN HD CENTRONICS TO 25 PIN D

HARD DRIVE INTERNAL CABLES

- 50 PIN RIBBON TO 50 PIN MICRO D
- 50 PIN RIBBON TO 50 PIN HD CENTRONICS
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PENTIUM-75	195 498
PENTIUM-90	299 598
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PENTIUM-120*	269 898
PENTIUM-133*	299 1298
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486DX2-66	153 298
486DX4-100	145 298

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Intel Motherboards have PCI slots, EIDE, Bus Mastering, up to 128MB RAM 256K Cache, 72 pin SIMM Capable, Retail & Floppy Support

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- 120 MHz 5x86/120GP-33 $249
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intel

- DX2-66 OVERDRIVE $249
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SCSI-IDE CONTROLLERS

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840 ISA SCSI Controller	$99
850 ISA SCSI Controller W/BIOS	$129
1240 Pro/Wide Port to SCSI Pro	$249
1260 Pro/Wide Port to SCSI Pro Ext	$299

Q-LOGIC

ISA-150 SCSI Controller	$99
ISA-150 SCSI Controller W/BIOS	$129
ISA-250 SCSI Controller W/BIOS	$149
VLB-150 SCSI Controller W/BIOS	$149
PCI-250 SCSI Controller W/BIOS	$199
PCMCIA Card SCSI Drivers	$299
PCMCIA Card SCSI Adapter	$299

adaptec

AHA-1505 ISA SCSI Controller	$99
AHA-1510 ISA SCSI Controller	$129
AHA-1520 ISA SCSI Controller	$149
AHA-1522 ISA SCSI Controller	$149
AHA-1540 ISA SCSI Controller	$149
AHA-1542 ISA SCSI Controller	$149
AHA-1740 EISA SCSI Controller	$149
AHA-1742 EISA SCSI Controller	$149
AHA-1510 ISA SCSI Controller W/BIOS	$149
AHA-1520 ISA SCSI Controller W/BIOS	$149
AHA-1522 ISA SCSI Controller W/BIOS	$149
AHA-1540 ISA SCSI Controller W/BIOS	$149
AHA-1542 ISA SCSI Controller W/BIOS	$149
AHA-1740 EISA SCSI Controller W/BIOS	$149
AHA-1742 EISA SCSI Controller W/BIOS	$149
AHA-1510 ISA SCSI Controller W/BIOS	$149
AHA-1520 ISA SCSI Controller W/BIOS	$149
AHA-1522 ISA SCSI Controller W/BIOS	$149
AHA-1540 ISA SCSI Controller W/BIOS	$149
AHA-1542 ISA SCSI Controller W/BIOS	$149
AHA-1740 EISA SCSI Controller W/BIOS	$149
AHA-1742 EISA SCSI Controller W/BIOS	$149

Adaptec

AHA-1505 ISA SCSI Controller	$99
AHA-1510 ISA SCSI Controller	$129
AHA-1520 ISA SCSI Controller	$149
AHA-1522 ISA SCSI Controller	$149
AHA-1540 ISA SCSI Controller	$149
AHA-1542 ISA SCSI Controller	$149
AHA-1740 EISA SCSI Controller	$149
AHA-1742 EISA SCSI Controller

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Versa 2000

- Lithium Ion battery technology
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- Built-in, upgradable 14.4 fax/modem (active models only)
- LOADS of **FREE** software preinstalled

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	350MB	$1999
486DX4/75	9.5" Active	350MB	2299*
486DX4/75	9.5" Active	350MB	2599
486DX4/75	9.5" Active	540MB	2799

*14.4 fax/modem not built-in



NEC Versa 4000

- Built-in CD-ROM Drive! (Standard on some models, optional on others)
- Pentium 75 and Pentium 90 processors
- 256KB Level 2 Cache to optimize performance
- Unbelievable displays – 65k color Dual Scan, 16.8 million color Active (High resolution Active Matrix displays available – 800x600 res.)
- Built-in 16-bit sound, microphone, MIDI and 2 built-in speakers
- Multimedia Docking station with outstanding Altec Lansing 4 speaker array

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	540MB	$3499
Pentium 75	10.4" Dual Scan	540MB	3799*
Pentium 75	10.1" Active	540MB	4199
Pentium 90	10.1" Active	810MB	4899*
Pentium 90	10.4" High Res.	810MB	5099

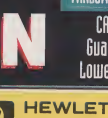
* Features built-in CD-ROM drive standard

Additional NEC Products

Chassis	Processor	HD	Price
NEC Ready Multimedia			
Mintlower 5010	486DX4/100	540MB	$1499
Mintlower 7020	Pentium 75	850MB	1799
Mintlower 9010	Pentium 90	850MB	2099
Mintlower 9510	Pentium 90	1.2GB	2499
Mintlower 9520	Pentium 100	1.2GB	2799

Monitors priced separately

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HP OmniBook 5000 Notebook PC

HP OmniBook 5000

- Pentium 90MHz with 32-bit PCI Local bus
- Up to 1.2GB drives available for high capacity storage
- High resolution – 800x600 resolution on notebook display
- Built-in 16-bit sound, microphone & speaker

Processor	Screen	HD	Price
Pentium 90	10.4" Active	1.2GB	$5579
Pentium 90	10.4" Active	1.2GB	6239*

*16MB RAM standard

HP OmniBook 600

WIN95 INSTALLED

- Weighs as little as 3.8 lbs.
- Built-in infrared for no hassle printer connection
- Instant "ON" ready-to-work state – lasts for months on a charge
- Built-in 16-bit sound, microphone & speaker (600CT/C, 9.5" Active Model only)

Processor	Screen	HD	Price
486DX2/50	8.5" Dual Scan	260MB	$2[illegible]
486DX4/75	8.5" Dual Scan	260MB	25[illegible]
486DX4/75	9.5" Active	260MB	30[illegible]

HP LaserJet Printers

HP LaserJet 5P printer (IBM, 6ppm, 600dpi)	$[illegible]
HP LaserJet 5MP printer (IBM&MAC, 6ppm, 600dpi)	10[illegible]
HP LaserJet 4L printer (IBM, 4ppm, 300dpi)	49[illegible]

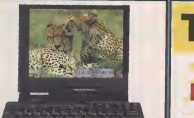
HP InkJet Printers

HP DeskJet 320 printer (portable)	$29[illegible]
HP DeskJet 320 printer w/feeder	33[illegible]
HP DeskJet 600C printer	29[illegible]
HP DeskJet 660C printer	38[illegible]
HP DeskJet 855C printer	54[illegible]
HP DeskJet 1200C printer	97[illegible]
HP DeskJet 1600C printer	134[illegible]

Home Office Products

HP OfficeJet	$59[illegible]
HP FAX-700	54[illegible]

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486DX4/100	10.4" Active	540MB	$4649
486DX4/100	10.4" Active	810MB	5099
486DX4/100	10.4" Active	540MB	5649*
486DX4/100	10.4" Active	810MB	6099*
Pentium 75	10.4" Active	540MB	4749*
Pentium 75	10.4" Active	810MB	5199*
Pentium 75	10.4" Active	540MB	5299
Pentium 75	10.4" Active	810MB	5749
486DX4/100	10.4" Active LCD	540MB	6099
486DX4/100	10.4" Active LCD	540MB	7099*
486DX4/100	10.4" Active LCD	810MB	7549*

*Features Built-In CD-ROM drive
+ Does not include built-in audio, telephony & modem

ThinkPad® 701

ThinkPad® 701

- Amazing pop-up, full-sized keyboard w/ jigsaw design
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- 14.4 fax/modem, speaker phone, answering machine & voice mail
- Built-in 16-bit sound, microphone, speaker & MIDI
- Built-in infrared for no hassle printer connections
- 20 **FREE** software titles preinstalled

Processor	Screen	HD	Price
486DX2/50	10.4" Active	360MB	$3699
486DX2/50	10.4" Active	540MB	4049
486DX4/75	10.4" Dual Scan	360MB	3549
486DX4/75	10.4" Dual Scan	540MB	3849
486DX4/75	10.4" Active	360MB	4299
486DX4/75	10.4" Active	540MB	4599

TOSHIBA



Portégé 610CT

Additional Products from Toshiba

Processor	Screen	HD	Price
Portégé 610CT WIN95 FREE UPGRADE			
Pentium 90MHz	9.5" True Color	720MB	$4359
T2150 WIN95 FREE UPGRADE			
486DX4/75	10.4" Dual Scan	500MB	$2979
486DX4/75	10.4" Active	500MB	3699
Satellite 2110/2130 WIN95 FREE UPGRADE			
486DX4/75	10.4" Dual Scan	330MB	$1979
486DX4/75	10.4" Dual Scan	500MB	2459
486DX4/75	10.4" Active	500MB	3059

Pentium 75 Built-in 4X CD-ROM



Satellite Pro 400

- Built-in 4X CD-ROM Drives/Swap Floppy & CD-ROM Active (needed only optional on Dual Scan)
- Pentium 75MHz Processor
- Built-in 16-bit sound, microphone, speaker & MIDI
- 10.4" Active & Dual Scan
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use
- Lithium Ion battery technology
- Built-in Infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75MHz	10.4" Dual Scan	810MB	$3539
Pentium 75MHz	10.4" Active	810MB	4359

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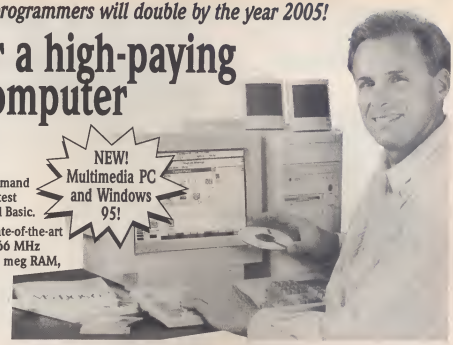
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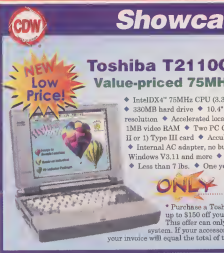
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4221 2GB SCSI-2	995.18
1936 3GB SCSI-2	568.85
3243 1.3GB SCSI-2	1499.42

CONNER

425MB IDE	152.26
540MB IDE	169.00
850MB Fast-ATA	299.73
1GB Fast-ATA	365.00

All Conner drives listed include complete installation hardware and software.

Seagate

426MB Fast-ATA	146.39
540MB Fast-ATA	174.50
810MB Fast-ATA	199.00
1GB Fast-ATA2	286.59
1GB SCSI-2	395.80

WESTERN DIGITAL

Caviar 540MB EIDE	179.85
Caviar 1.2GB EIDE	211.67
Caviar 1.2GB EIDE	315.30

CONTROLLERS

Acculogic SIDE-3+ w/on-board BIOS	46.90
Acculogic SIDE-4+ w/par, Exec. game	35.95
Acculogic SIDE-4VL EIDE, 16550 serial	89.76
Acculogic Fast-VL w/bus & vcca	64.95
Adaptec AHA1505 SCSI-2 CD	84.50
Adaptec 1542B VLB SCSI-2	265.46
Adaptec AHA1740 VLB SCSI-2/EIDE	265.30
Adaptec 2842 VLB SCSI-2	349.83
Promise 2300+ EIDE VLB	79.95

MODEMS & COMMUNICATIONS

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SPORTSTER MODEMS

14.4K internal w/fax, voice	94.81
14.4K external w/fax	111.00
14.4K PCMCIA w/fax & voice	193.05
V.14 4K external w/fax & voice	173.77
V.34 28.8K internal w/fax & voice	229.50
V.34 28.8K external w/fax & voice	278.78
V.34 28.8K external w/fax	199.56
V.35 8K internal w/fax & voice	204.97
V.35 8K external w/fax & voice	221.33

COURIER MODEMS

V.34 internal w/fax	367.80
V.34 external w/fax	422.32

Hayes

ACCURA 144 internal w/fax	91.87
ACCURA 144 external w/fax	111.16
ACCURA 144 V.34 internal w/fax	173.78
ACCURA 288 V.34 external w/fax	218.88
ACCURA 144 external w/fax	111.16
OPTIMA 144 pocket w/fax	282.14
OPTIMA 288 V.34 pocket w/fax	419.44
OPTIMA 288 V.34 external w/fax	419.44

PRACTICAL PERIPHERALS

14.4 internal w/fax	73.85
14.4 Mini Tower w/fax	89.76
V.34 28.8 internal w/fax	139.90
V.34 28.8 Mini Tower w/fax	209.94
PCMCIA Modem Spare	119.00

BOCA

Multimedia Voice Modem 14.4 internal	99.55
Online Express 14.4 internal w/fax	64.20
Online Express external w/fax	79.74
V.34 28.8 internal w/fax	159.00
V.34 28.8 external w/fax	199.00

MICROCOM

DeskPorte ES 14.4	146.39
DeskPorte Fast ES V.34 28.8	179.94
DeskPorte Fast EP V.34 28.8	229.19

MODEMS & COMMUNICATIONS

ZOOM

V.34 FaxModem internal	142.99
V.34 FaxModem external	185.37
V.34 FaxModem w/14.4VH Internal	195.92
Voice FaxModem V.32 14.4V external	146.30
14.4 V.32bis w/fax internal	76.74
14.4 V.32bis w/fax external	110.16

BATTERY BACKUP AND UPS

American Power Conversion

Back UPS Pro 280 PnP	163.43
Back Pro 420 PnP	249.79
Back UPS Pro 650 PnP	309.74
SmartUPS 700	347.94
SmartUPS 1000	597.64
SmartUPS 1400	697.74
SmartUPS 2200	1109.89
SmartUPS 3000	1707.79
SurgeArrest Network	33.35
SurgeArrest Pro	49.95
SurgeArrest Network + Phone	49.95
Line Conditioner	119.08

Tripp Lite

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BC PRO 675	231.43
BC PRO 1000	316.01
BC PRO 1350	327.58
BC PERI 900	420.01

Tripp Lite Smart UPS Series

SMART 280 LAN	215.39
SMART 1000 LAN	455.07
SMART 450 LAN	273.04
SMART 1400 LAN	589.41
SMART 675 LAN	315.69
socket 6 OUTLET	36.95
SMART 850 LAN	389.74
socket 8 OUTLET	46.38

PERIPHERALS

3Com EtherLink III combo	213.38
Adaptec APA1460 SCSI-2	399.68
Adaptec 2842 VLB SCSI-2	349.83
Hayes ESCC V.34 kit	294.87
IBM Token Ring 16/4	338.57
Megahertz 10/100 PCMCIA	299.00
Megahertz 14.4K data/fax	179.48
Megahertz 14.4K data/fax/ether	299.00
Megahertz Xjack Dual 14.4 data/fax	259.00
Megahertz V.34 Xjack data/fax	299.00
Nwr Media Bay Ether 10BT adapter	137.92
Nwr Media Wave Jammer sound card	229.48
Nwr Media Wave speakers	119.00
Simple Tech 14.4K external	139.00
Simple Tech Ether/Net 10BT adapter	129.18
Simple Tech 130MB hard drive	346.52
Simple Tech 170MB hard drive	399.00
Simple Tech 340MB hard drive	533.72
SMC Elite Ethernet combo	173.77
Xircom Ethernet/modem 10BT	319.89
Xircom Ethernet/modem combo	418.67
Xircom Token Ring 16/4	469.84

INTEL OVERDRIVE

Intel OverDrive DX2/50	125.68
Intel OverDrive DX2/66	154.76
Intel OverDrive DX4/75	194.62
Intel OverDrive DX4/100	194.62
Intel OverDrive P5 w/ 50MHz	280.37

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- TV TUNER MODULE (Optional)
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- TRUE SOUND AUDIO SYSTEM
- EXTRA PORTS



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- VESA LOCAL BUS VIDEO
- DOUBLE LIFE NiMH BATTERY
- TRUE SOUND AUDIO SYSTEM



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Nothing can catch this portable when it's on the run. Our new NP7500 Pentium 100MHZ is the most advanced, highest performance notebook available today. It's also more powerful than most desktops. The Pentium CPU has twice the performance of a 486 DX-2/66 and the capability to crunch more than 100 MIPS. Add to this a 256K cache and the unsurpassed performance of VESA Local Bus Video and Local Bus IDE, and this notebook will get you where you're going fast.

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- VESA LOCAL BUS VIDEO & LOCAL BUS IDE
- BUILT-IN AUDIO SYSTEM
- PENTIUM POWER

NP9500

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32-bit Local Bus IDE
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16-bit Stereo Audio with 2 Stereo Speakers and 1 Microphone
8MB RAM Expandable to 64MB
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Color VGA LCD Display Supports up to 640 x 480, 64K Colors; CRT: 1024 x 768, 256 Colors
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Integrated Pointing Device
Advanced Power Management with SMM
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Super Long Life NiMH Battery
2 16C550 Compatible Serial Ports
1 Parallel Port with ECP/EPP Support
Other Ports: Game, Ext. Keyboard, Ext. VGA Monitor & Ext. FDD
Jacks - 1 line in, 1 line out & 1 Microphone
86-Key Keyboard
Microsoft Windows 95
Carrying Bag & AC/Adapter
Weight 7.5lbs. with Battery
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NP9500 OPTIONS

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- Secondary Battery Module
- 3.5" Removable HDD Module
- Car Adapter
- Numeric Keypad
- PCMCIA Cards

NP8500

- 11.3" Dual Scan Color VGA Display; CRT: 1024x768, 256 colors
- Intel Upgradeable 486 CPU
- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 16-bit Stereo Audio with 2 Stereo Speakers & 1 Microphone
- 4MB RAM Expandable to 20MB
- Removable 540MB Hard Drive (810MB or 1.35GB Optional)
- 3.5" 1.44MB Floppy Drive Replaceable with 2nd battery pack
- Simultaneous CRT & LCD Operation
- Integrated Pointing Device
- Intelligent Power Management w/ SMM
- 2 PCMCIA Type I & II or 1 Type III Slots
- Extra Long Life NiMH Battery
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Other Ports: Ext. Keyboard, Ext VGA Monitor & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft Windows 95
- Carrying Bag & AC/Adapter
- Weight 5.9lbs. with Battery
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NP8500 OPTIONS

Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards (Fax/Modem, Ethernet, SCSI & more)



NP7500

Pentium:

- 256KB Secondary Cache
- 8MB RAM Exp to 40MB
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Suspend to Hard Drive Feature
- Color VGA LCD Display Supports up to 640 x 480, 64K Colors

486:

- 4MB RAM Exp. to 36MB
- 1 Serial & 1 Parallel Port

- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 32-bit Local Bus IDE
- 16-bit Stereo Audio with 2 Stereo Speakers & 1 Microphone
- Removable 540MB Drive (810MB or 1.35GB Optional)
- 3.5" 1.44MB Floppy Drive
- 9.5" Mono, 10.3" Dual Scan or 9.5" Active Matrix VGA Display
- CRT: 1024x768, 256 Colors
- Simultaneous CRT & LCD Operation
- Large Built-In 19mm Trackball and Hand Rest
- Intel Upgradable CPU
- Intelligent Power Management with SMM
- 2 PCMCIA Type I & II or 1 Type III Slot
- Super Long Life NiMH battery
- Other Ports: Ext. keyboard, Ext. VGA monitor, & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft Windows 95
- Carrying Bag & AC/Adapter
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NP7500 OPTIONS

Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards (Fax/Modem, Ethernet, SCSI & more

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486DX4-75	$1975
486DX4-100	$1995

NP7500	9.5" MONO	10.3" COLOR DUAL SCAN	9.5" COLOR ACTIVE MATRIX
486DX2-66	$1525	$1895	$2275
486DX4-100	$1575	$1945	$2325
PENTIUM-75		$2295	$2675
PENTIUM-90		$2425	$2795
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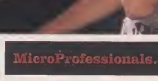
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- Plug and Play Flash Bios
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- **850MB** IDE HD, 10ms
- 3.5" 1.44 MB Floppy Disk Drive
- 64-Bit PCI Bus Graphics Card w/2MB
- PCI Local Bus IDE Controller
- **15"** .28mm Flat Color Monitor
- Quad-Speed CD-ROM Drive
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- Enhanced 101 Key Keyboard & Mouse
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- Quad-Speed CD-ROM Drive
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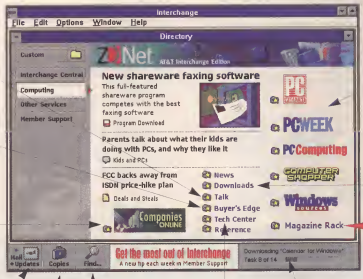
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Please answer questions below:

1. Where do you use your computer? (Check one only):
1. ☐ Home 2. ☐ Business 3. ☐ Both

2. What kinds of computers do you use? (Check all that apply):
1. ☐ IBM/Compatible Laptop 2. ☐ IBM/Compatible Desktop 3. ☐ MAC

3. Do you plan to buy any of the hardware or software mentioned below in the next three months? (Check all that apply):

HARDWARE
1. ☐ PC
2. ☐ MAC
3. ☐ Laptop
4. ☐ Printer
5. ☐ Monitor
6. ☐ Disk/Tape Back-up
7. ☐ Add-in Board
8. ☐ Modem
9. ☐ Input Device
10. ☐ Local Area Network
11. ☐ Windows

SOFTWARE
12. ☐ Accounting
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22. ☐ Programming Language/ Compiler
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24. ☐ CAD
25. ☐ CD-ROM
26. ☐ On-Line Services

4. From which of the following sources do you purchase personal computer products? (Check all that apply):
1. ☐ Specialty Computer Retail Stores
2. ☐ Mail Order Firms
3. ☐ Direct from Manufacturers
4. ☐ Other

For information on all of the Windows 95 products in this issue, circle the appropriate number(s) below.

Windows 95 Hardware	Windows 95 Software
1001	1002

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Windows 95 Hardware 1001
Windows 95 Software 1002

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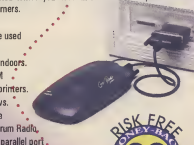
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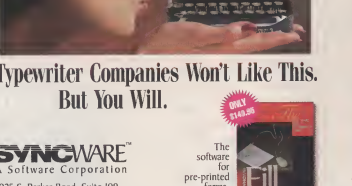
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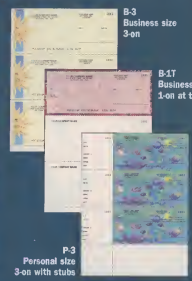
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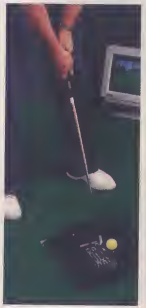
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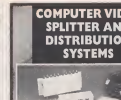
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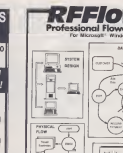
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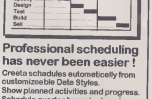
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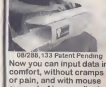
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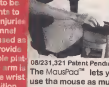


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PHOTOGRAPHS BY ERNIE FRIED-ANDER

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The Organized Office

Look for the Label When it comes to big batches of labels for mass mailings, a typical page printer fares just fine. But for just a few labels at a time, the convenience of a dedicated label printer can't be beat. Seiko Instruments USA's Smart Label Printer EZ30, below left ($150 est. street price; 408-922-5900), includes software that captures the address from letters written in any word processor. The printer accepts a variety of standard label shapes and sizes from envelopes, to file folders, to floppies and videocassettes. Brother International's P-Touch PC, below right ($250 est. street price; 800-276-7746), can print sequential serial numbers or a time/date stamp, and uses continuous tape (instead of label rolls) that can also function as rub-on transfers. Both printers can mix graphics with text and print postal and bar codes—and both include proprietary database software. . . . **Space, the Limited Frontier** If your CD-ROMs have taken over your shelves, scrap the bulky jewel cases and reclaim space with Avery Dennison's Roladisc desktop and portable CD-ROM storage systems ($6 to $25 est. street price; 800-262-8379). Roladisc stores CDs in clever dual-pocket sleeves—put a disc in one and the liner notes in the other. Up to 100 discs (sans liner notes) fit into the 16-inch wood model (above right). . . . **Killer Paperless Combo** Sophisticated document-management systems use to be the exclusive domain of the Fortune 500. No more. Take Visioneer's PaperPort document scanner ($379 est. street price; 800-787-7007), Caere's PageKeeper software ($99 est. street price; 800-535-7226), and Iomega's Zip drive ($200 list price; 800-697-8833), and you have a powerful paperless package for under $700. Not only will this help you streamline the paper chase across your desk,





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Reader Service Numbers: Smart Label Printer EZ30 *723*; P-Touch PC *724*; Roladisc *725*; PaperPort *726*; PageKeeper *727*; Zip drive *728*; SurfWatch, *729*

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No-Think Ink Jets

After you've spent hours crafting the perfect report, proposal, or marketing plan, few things are more frustrating than having your hard work trapped in your computer, unable to make its way to the printer. In corporate offices, this isn't a big deal—just call the information systems person. In a Soho world, you *are* the IS person, and you need products that work. You can't waste time diagnosing and fixing printer problems: You have a business to run.

You need to invest some time up front and choose a color ink-jet printer that's easy to use and maintain—one that communicates with you when you encounter difficulties. This way you'll be able to stop most of your maintenance problems cold. We put the four leading ink jets targeted for the Soho market through the usability grind to determine which will work best for you—and your business.

Our Usability Labs' evaluations focused on printers priced under $600. We passed on a fifth printer, Okidata's Okijet 2010, because it's identical to Lexmark's WinWriter 150c, and it carries a street price of about $45 more.



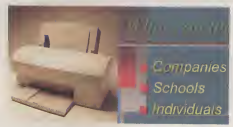
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DeskJet 660C / Hewlett-Packard / (800) 752-0900 / $499 est. street price / *Reader Service No. 732*

Ingenious Ink Jet It was a close call, but one printer separated itself from the rest of the pack: Hewlett-Packard's DeskJet 660C. If you're looking for a printer that will give you all-around great performance, the DeskJet 660C has your name written all over it. There really wasn't anything this printer didn't do well in our tests. (See "Low-Cost, High-Impact Color," New! August, page 80.)

Even if you've never set up a printer before, the DeskJet 660C will make you feel like an expert. The documentation is easy to follow and includes many helpful illustrations. And the software? Insert the disks and let HP take care of the rest. You'll find a useful Tour Guide tutorial once you've installed the software.

The online information is accessible, user-friendly, and—most important—helpful. And for solving specific problems, you'll find troubleshooting information both online and in hard copy. You should be able to recover from any mishaps in minutes.

Of course, all of these ease-of-use bonuses don't matter if the output doesn't look good. But that's not a problem with the DeskJet 660C. Its print speeds are among the fastest in this class and the printouts are first-rate. The black text is sharp and clean, and colors dance off the page.

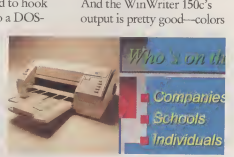


Fast and Friendly: With easy setup and nice output, the WinWriter 150c is a steal.
WinWriter 150c / Lexmark Int'l / (800) 358-5835 / $349 est. street price / *Reader Service No. 731*

Wondrous WinWriter If you are a Windows-only house, Lexmark's WinWriter 150c will fit in nicely. If you need to hook up your printer to a DOS-only or Macintosh system, look elsewhere. The WinWriter 150c works only with Windows 3.1 (including DOS apps run under Windows), Windows for Workgroups 3.11, and Windows 95.

Lexmark has included some nice touches in the WinWriter 150c, the most notable of which is the online information and data on the printer's status. If you're into feedback, you'll love the WinWriter 150c's software, which keeps you posted on nearly every move the printer makes. You can opt to hide the software, but if you choose to display it, you'll be able to track the progress of your document, monitor the ink level of the cartridge, and more.

Setup is simple, with well-illustrated instructions that guide you through each step. And the WinWriter 150c's output is pretty good—colors



Picture-Perfect: Only the Stylus Color will do if you demand premium output.
Stylus Color / Epson America / (800) 289-3776 / $530 est. street price

PHOTOGRAPHS BY ERNIE FRIEDLANDER



One for the Road: The BJC-70 is hard to beat when it comes to price and size.

Canon BJC-70 / Canon Computer Systems / (800) 848-4123 / $350 est. street price / *Reader Service No. 733*

are bright, although not as vibrant or crisp as those from Epson's Stylus Color or HP's DeskJet 660C. Text is less sharp and not as black.

Exquisite Color Few ink-jet printers offer what Epson's Stylus Color gives you: up to 720-by-720-dpi output, which results in dazzling, high-quality documents. If output is your main concern, and if you're able to throw speed and a little usability by the wayside, then your clear choice is Epson's Stylus Color. (See "The Desktop Superguide," June, page 148.)

Setup wasn't too tricky, but you won't get the nice ease-of-use touches we found with the HP and Lexmark printers. And our testers encountered one particularly annoying setup glitch: When you run a test print, the Stylus Color will output the test page endlessly until you run out of paper or turn off the printer—the more standard practice of making one test printout would certainly suffice.

The Stylus Color makes a lot of noise during setup and printing, and the calibration noises can be unsettling because you're never quite sure what it's up to.

But these quirks don't matter once you see the printer's high-quality output. Granted, 720-dpi output requires special paper, (which, at about 13 cents a sheet, raises the cost per page significantly), but if you need to print photographic images or complex graphics, you'll be hard-pressed to find an ink jet like this one.

Jet-Set Ink Jet Canon's BJC-70 stands out from the rest of the printers we tested because of its tiny size. Packed into a 3.3-pound package, the BJC-70 provides a mobile option—even if you're only moving it from one office (or room) to another.

Setup is straightforward. The printer includes a useful Quick Start Guide and helpful software. Once it's running, the online Visual Guide provides all sorts of valuable status information. Our usability testers noted two slight problems with the Visual Guide, however. First, after installation, there were no cues to indicate it was there, so they forgot about it until they found it

HOW IT WORKS

WHAT TO LOOK FOR IN **INK-JET PRINTERS**



Soho Usability Test

PC COMPUTING TESTED USABILITY LABS

Cost per Page

Type of Document	Canon BJC-70	Epson Stylus Color	HP DeskJet 660C	Lexmark WinWriter 150c
Black Text (5% Coverage)	4 cents	4 cents	4 cents	3 cents
Color Graphics (30% Coverage)	32 cents	21 cents	22 cents	32 cents

NOTE: COST PER PAGE IS BASED ON VENDOR-SUPPLIED ESTIMATES.

mentioned in the written documentation. Pointers to the online help for the other printers were more obvious. Second, while the Visual Guide helped testers identify and diagnose problems, it didn't offer ready solutions like HP's help did.

Despite its small size, the output from Canon's BJC-70 is surprisingly good. Colors are vibrant, although the text is somewhat fuzzy compared with the other printers' output. Of the four models tested, the BJC-70 yields the weakest output.

As You Like It Choosing the perfect ink-jet printer for your Soho needs isn't that tricky. But you need to consider the many differences among the alternatives. Before you take the plunge, spend a few minutes outlining what factors are most important. Is fast printing vital? If so, lean toward HP's DeskJet 660C or Lexmark's WinWriter 150c, both of which tend to be faster than the other contenders. Is brilliant output paramount? Then Epson's Stylus Color is your printer, because it produces outstanding documents—if you don't mind shelling out for the special paper.

Don't forget about long-term costs. The price per page varies and depends on how much ink and what type of paper you need. Plain paper is the least expensive, but coated or glossy paper give you much better results. For plain-paper printing, expect to spend anywhere from 3 to 30 cents a page, depending on the printer and the type of documents.

Finally, it's always important to check out support and warranties. HP offers a three-year warranty on the DeskJet 660C; all other vendors offer two-year warranties.

Choosing which printer to buy is probably the toughest part. Getting it set up and running? Piece of cake. You'll be printing professional-quality color documents in no time. KYLA K. CARLSON

DECISION MAKER

GET THE **COLOR INK JET** YOU NEED



Lab notes

We brought testers who matched the Soho printer-users' profile into our Usability Labs and monitored them as they performed a scripted set of typical printing tasks. They found that the most valuable part of a printer is the software: It's the driver's seat, so the more control, the better.

HP entices users into the DeskJet 660C's online information by offering an animated HP Tour Guide right from the start. If you run into problems, you're quickly guided to a solution.

"There is an actual tutorial for the [DeskJet 660C] and the software drivers!"
RETIRED LIBRARIAN

Lexmark's WinWriter 150c provides great feedback, including the file status and the level of ink remaining, while online help for Epson's Stylus Color covers the basics without any real extras.

"One nice thing about [the WinWriter 150c] is that it gives you a graphic status and indicates what it is doing."
SALES REPRESENTATIVE

Canon's Visual Guide is valuable, but testers had to be reminded of its existence. It was good for diagnosing problems, but fell short in offering solutions.

"[Canon's Visual Guide] told me what was wrong but offered no help on how to fix it."
COMPUTER TRAINER

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Hardware by FUJITSU

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BY WENDY TAYLOR AND MARTY JEROME

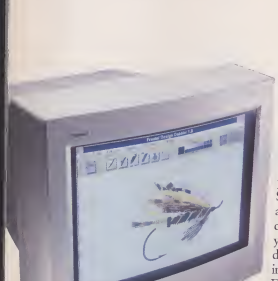
In Living Color

Producing colorful pages is easy with the right printer. But how do you get color into your PC? Scores of new products help you nab color images to dress up reports and add splash to newsletters. Once the pricey province of graphic artists, the best of these gadgets cost less than you might expect.

Point and Shoot Want the realism of a photograph but can't wait for film? Digital cameras, which store their images on your hard drive rather than on film, keep getting better and cheaper. Our favorite, Apple's QuickTake 150, snaps first-rate color images and even includes a built-in flash. Take it to parties and impress your friends.

QuickTake 150 / Apple Computer / (800) 538-9696 / $600 est. street price / *Reader Service No. 734*





Tweak and Twiddle Want to make that green wing a little more yellow? JASC's Paint Shop Pro is the most affordable digital darkroom/photo editor you'll find. If you're drawing freehand color images, Fractal Design's Dabbler can turn even the graphically challenged into true artistes. And don't forget to give yourself the big color view with Sony's bright and crisp 17-inch Multiscan 17sf.

Paint Shop Pro / JASC / (800) 622-2793 / $69 est. street price / *Reader Service No. 736*

Dabbler / Fractal Design Corp. / (800) 297-2665 / $99 est. street price / *Reader Service No. 737*

Multiscan 17sf / Sony / (800) 352-7669 / $899 est. street price / *Reader Service No. 738*

Photo Finish How do you drop a snapshot of your latest product into your promo flyer when you're on the road? The EasyPhoto Reader from Storm Software plugs in to a serial port, reads photo prints, and then lets you edit the prints onscreen with drag-and-drop ease.

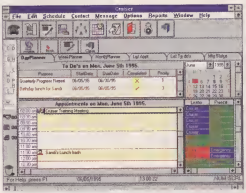
EasyPhoto Reader / Storm Software / (800) 275-5734 / $249 est. street price / *Reader Service No. 735*



PHOTOGRAPHS BY STEVEN UNDERHOOD



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Training Wheels

Having trouble figuring out this whole Web thing? Let Personal Training Systems' Official Guide to Netscape Navigator teach you the ins and outs of the best Web browser.

Official Guide to Netscape Navigator / Personal Training Systems / (415) 482-2100 / $29 est. street price / *Reader Service No. 637*

All You Need Online

Internet Chameleon 4.5 is the latest iteration of NetManage's outstanding I-Way suite, which includes WebSurfer and Internet News Reader.

Internet Chameleon 4.5 / NetManage / (408) 973-7171 / $39 est. street price / *Reader Service No. 638*

Total Access

Get connected with EarthLink Network's Total Internet Access, a suite that includes Netscape's Navigator and Internet access via a nationwide toll-free number.

Total Internet Access / EarthLink Network / (213) 644-9500 / Free software, service charges vary / *Reader Service No. 639*

GLOBAL BROADCAST

Radio-Free Internet

Lots of Web sites boast sound files. But playing these files is like following a Rube Goldberg diagram: First you have to find, download, install, and configure an audio player; then download the sound file you want; wait to save the file on your hard drive; launch the player; and, finally, play the file.

Tune your Web browser to Progressive Network's RealAudio, however, and you can listen to real-time AM-quality audio without first downloading a sound file. RealAudio brings audio-on-demand to the I-Way, and a lot of folks are listening: Since last May, more than 250,000 people have downloaded free RealAudio players. This is great news for Progressive Network, which plans to give away the player and sell RealAudio Studio software for creating and enhancing broadcasts, and RealAudio Server, which provides simultaneous streams of audio programming.



Tune In: RealAudio brings real-time, AM-quality audio broadcasts to the World Wide Web. Simply point and listen.

Content providers include ABC, which offers the latest sports, news, and commentary, and National Public Radio, where you can hear broadcasts such as *Morning Edition* and *All Things Considered*. And more content providers are on the way: CBS, MCI, Starwave, and Dow Jones have all purchased RealAudio Servers.

To get real-time, continuous playback, RealAudio streams quarter-second audio packets from the server to your browser. But why not just listen to the radio? Your radio receives only those stations within its range, and programs are strictly regulated by the Federal Communications Commission. RealAudio, on the other hand, gives you unregulated programming from anywhere in the world—and you can listen whenever you want. RealAudio is a great alternative for anyone who wants to be a broadcaster.

ONE-MINUTE GUIDE: Web Tunes: Essential RealAudio Info and Sites

RealAudio lets you receive real-time, AM-quality audio broadcasts from World Wide Web sites. Here's where to tune in:

PROGRESSIVE NETWORKS This is the place to start. Here, you fill out a simple form and receive e-mail instructions on how to download your free RealAudio Player. You can also get information on RealAudio Server, which supports simultaneous audio streams, peer communications with proxy servers, and more (http://www.realaudio.com/).

Next, you'll want to find RealAudio content to listen to, such as:

ABC The American Broadcasting Company provides hourly updates of sports and news (http://www.realaudio.com/contentp/abc.html).

NATIONAL PUBLIC RADIO Get daily programming of popular shows like *All Things Considered* (http://www.realaudio.com/contentp/npr.html).

KOREAN POP TUNES Get Korean hits from a South Korean radio station, (http://www.iworld.net/Entertainment/Gayo/).

C-SPAN NETWORKS Check out this site and track Election '96 (http://www.cspan.org/index.html).

RADIO ON THE INTERNET This great home base offers live broadcasts and more than 200 hours of prerecorded programs (http://town.hall.org/radio/).

ILLUSTRATION BY PETER ALAN GOULD

Free Stuff!

Rich Schwerin: Log on and download.

Presto, Change-o *****

Envisions' Presto is all-in-one scanning software, and it's free!

PC Contact: PRESTO.ZIP/Library 1 **Site:** http://www.ocm.com/envisions/ **Size/Time*:** 200K/5

View Documents on Any Platform ****

WordPerfect's portable document viewer, Envoy, is now free.

PC Contact: ENVOY.ZIP/Library 0 **Site:** http://wp.novell.com/envoy/envoytoc.htm **Size/Time*:** 400K/8

Cache Your CD-ROM *****

Circuit Systems' CD-Quick Cache gives you optimal CD-ROM cache performance.

PC Contact: CDQCKC.ZIP/Library 0 **Size/Time*:** 320K/7

Collect Your Font ***

Info Fonter 7.0 is a useful shareware utility for collecting font information in one location.

PC Contact: FONTER.ZIP/Library 0 **Size/Time*:** 170K/2

How Smart Is Your Wallpaper? ***

SmartPaper is an intelligent shareware wallpaper-management utility for Windows.

PC Contact: SMTPPR.ZIP/Library 0 **Size/Time*:** 39K/1

Gauge Your Performance *****

WinBench 95 is the latest version of Ziff-Davis's industry-standard benchmark for gauging PC performance.

PC Contact: WINBEN.EXE/Library 1 **Size/Time*:** 2MB/45

Modem Sharing for Windows for Workgroups ****

WinPort 5.0 allows Windows for Workgroups users to share modems on a network.

PC Contact: WINPRT.ZIP/Library 5 **Size/Time*:** 100K/30 seconds

Put a Winsock in It ****

If you don't already have it, here's the WINSOCK.DLL file that Mosaic, Netscape, and other I-Way suites demand.

PC Contact: WINSOC.ZIP/Library 5 **Size/Time*:** 106K/1

WordPerfect to the Max *****

WordPerfect fanatics won't want to miss Ron White's WordPerfect macros.

PC Contact: WPMAX.ZIP/Library 5 **Size/Time*:** 8K/5 seconds

Worldwide Image Compression ****

Check out a free trial of Johnson Grace's Art Press, an online image-compression package.

PC Contact: ARTJGC.ZIP/Library 8 **Site:** http://www.jgc.com/ **Size/Time*:** 500K/9 seconds

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Package Deals: Macros, Utilities, and More

HONK IF YOU LOVE DOS

For some, DOS is not dead. Third Party is a collection of DOS utilities, including a batch-file enhancer, a file finder, and other nifty DOS gems.

PC Contact, Library 2
3RDPTY.ZIP
339K/4
****

CLEAN UP YOUR ACT

Act Tool is an extensive collection of macros that let you marry Symantec's Act to Microsoft's Word for powerful contact management.

PC Contact, Library 6
ACTOOL.ZIP
92K/1
****

MUTUAL-FUND ANALYSIS

Look before you leap with a demo from Monocle for Windows, a complete mutual-fund and financial-analysis tool. For more info, call (800) 251-3863.

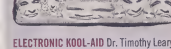
PC Contact, Reader's Own Utilities, MCDEMO.EXE
614K/5
***

*Ratings: ***** World Series champion. **** Major leaguer. *** Farm-club rookie. ** Washed-up repeat offender. * Prima donnas on strike . . . again!*

Insites

SCHWAB THE OECK Check on your Schwab-Funds at Charles Schwab & Co Online.
http://www.schwab.com/

HELP ME, OBI-WAN *Star Wars* fanatics should steer their Tie fighters to LucasArts' Web site.
http://www.lucasarts.com/menu.html



ELECTRONIC KOOL-AID Dr. Timothy Leary invites you to tune in to his home page, a complete guide to the psychedelic experience. It's a trip.
http://www.intac.com/~dmitri/dlh/learywilson.html

DESKTOP WALL STREET The *Wall Street Journal*'s Money & Investing Update delivers the top news in business and finance, with hourly market updates.
http://update.wsj.com/

RETURN TO SENDER If you absolutely must send snail mail, the U.S. Postal Service has a handy zip-code directory for all 50 states.
http://www.usps.gov/

PICTURE THIS! PhotoDisc, a Seattle-based, digital stock photography firm, has free images and design samples for download.
http://www.photodisc.com/

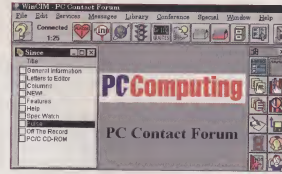
BUSINESS TO BUSINESS VirtuMall has launched a Soho (small office/home office) area, offering a range of business-related products and services.
http://www.virtumall.com/soho/

DISCOVERING SCIENCE Explore the Discovery Channel Online, with daily features in history, science, nature, people, living, and more.
http://www.discovery.com/DCO/doc/1012/online.html

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1. Call CompuServe at (800) 848-8199 for a local access number.

2. Set your software to 7 data bits, even parity, 1 stop bit, full duplex, and dial the service.

3. Press Ctrl-C to get the system's attention, and at the HOST NAME prompt, type CIS and press Enter.

4. For USER ID, type 177000,5300, and at the PASSWORD prompt, type PCCONTACT.

5. At the ENTER AGREEMENT NUMBER prompt, type PCC95.

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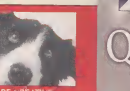
Connectix

System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11 • 4 MB RAM required











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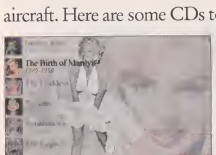
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CD-RONWhite



After Hours

Every captain of industry needs to kick back once in a while. By day, you may be the terror of Wall Street, but on the few evenings you can ditch those hectic wine-and-dines, you can become your virtual self—an amateur sleuth, a world traveler, or a connoisseur of vintage aircraft. Here are some CDs to keep your daydreams alive.



Digital Detective: You're the sleuth investigating Marilyn's death.



HARD EVIDENCE: THE MARILYN MONROE FILES ●●●●

Norma Jean has been dead long enough now that she can become a player—albeit, a dead one—in a computer game. Hard Evidence: The Marilyn Monroe Files is similar to the Who Killed . . . ? series of role-playing detective games from Creative Multimedia. The difference is that the Who Killed . . . ? deaths are fictitious. This dead body is real, and the CD lets you read scanned versions of the actual coroner's reports and investigation files. As a reporter, police detective, coroner, or district attorney, you can track down evidence and rumors to help determine how and why Marilyn died.

Unless I missed some secrets hidden deep in the recesses of the game, there's not much new information. You'll hear the same old stories of her instability, rumors of her affairs with the Kennedy men, and suspicions of Mafia involvement. But there's something eerie about it. As essential as the autopsy reports are to the CD's film-noir ambiance, I really don't need to know that Marilyn might have been killed by an intentional overdose of a sedative enema. Give me a call if you find out O. J.'s involved.

Hard Evidence: The Marilyn Monroe Files / PerfectHome Novell / (800) 451-5151 / $50 est. street price / *Reader Service No. 627*



BERNARD OF HOLLYWOOD'S MARILYN ●●●

If you want Marilyn without the grisly undertones, get Corel's Bernard of Hollywood's Marilyn, which includes more than 100 photographs taken by Bruno Bernard. The photos, newsreel videos, and narration provide pleasant entertainment for any Marilyn Monroe fan—with no call for introspection.

Bernard of Hollywood's Marilyn / Corel Corp. / (800) 772-6735, (613) 728-8200 / $49 est. street price / *Reader Service No. 628*



GONE FISHIN' ●●●

Didn't mean to get so heavy with Marilyn back there. Why don't we lighten up, kick back, and go fishing? We can, with Gone Fishin'. This DOS CD virtualizes the total fishing experience. It covers everything from buying lures and selecting a fishing hole to motoring around aimlessly, checking sonar, and casting and reeling in the big catch or, more likely, an empty lure. Gone Fishin' is every bit as lazy, boring, and pointless as the real thing, but without the sunburn and hooks in your fingers. If you like to fish, you'll love killing a six-pack while you play this CD. Otherwise, just go get some sushi.

Gone Fishin' / Amtex Software / (800) 810-7345, (613) 967-7500 / $60 est. street price / *Reader Service No. 629*



NINE MONTH MIRACLE ●●●

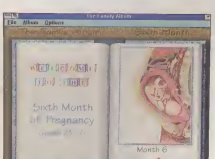
The biggest disappointment of the last nine months is Nine Month Miracle. It comes from the same folks who brought us A.D.A.M.: The Inside Story, the ultimate explore-the-human-body CD with slick graphics, a great interface, and even a few touches of humor.

The new CD, as you might guess, explores pregnancy, which sounds like a great idea for the A.D.A.M. treatment. There are photos of a human embryo at different stages of development, videos of what happens during pregnancy, and animations of the phases of pregnancy, such as conception, where the virtual touch is more discreet. But that dash of humor in the original A.D.A.M. has turned into a full body blow. The CD pads every step with conversations between Adam and Eve, an expectant couple. Their dialogue is so coyly contrived and their jokes so cheerfully bad that the CD makes "Father Knows Best" seem like a grim tale by Dostoyevsky.

Nine Month Miracle has modesty settings that put fig leaves over the naughty bits of Adam and Eve to lock out their more unseemly sections. But that seems strange. What's the point of a sex-education CD if

●●●●● *Stamp with a rare upside-down airplane.* ●●●● *Trophy for wood carving.*
●●● *Moth collection.* ●● *Macramé wall hangings.* ● *"Authentic" coin dated 204 B.C.*

PHOTOGRAPH BY JAMES McGOON



Womb with a View: Great anatomy, bad humor, and odd modesty.

you can't use it as a substitute for one of the things parents dread most—explaining the birds and bees to pubescent kids? But I think I may have figured out the modesty thing. The CD's cutesy dialogue is generally so boring that no kid would see the whole thing through. By forbidding a few fruits, kids are tricked into thinking there are hidden secrets on the CD so titillating that they may continue watching and accidentally learn something along the way.

Nine Month Miracle / A.D.A.M. Software / (800) 408-2326, (619) 549-0222 / $40 est. street price / *Reader Service No. 630*



ABC WORLD REFERENCE: 3D ATLAS ○○○○○

There's one problem with atlases: They're cluttered with maps of Iceland, Siberia, Los Angeles, and other places you hope to never go. And they're boring. They show you political boundaries, where cities are located, the exact sizes of countries, and that's about it. ABC World Reference: 3D Atlas proves there's more than one way to look at the Earth.

Oh, the Windows CD has the usual stuff you'd see on any ordinary atlas CD like political boundaries and flags of the nations. But 3D Atlas also shows you ecosystems, geological formations, and the lights of cities at night—all based on satellite photos seamlessly blended together to form a spinning globe. (The *3D* in the title probably refers to this. In any case, there are no red and blue 3-D glasses. Sorry.) You can zoom down until you're hanging like a cloud miles above your favorite city. There are conventional slide shows of selected cities and countries to illustrate how people live. But the fascination with slides will quickly fade when you see the swooping flybys over mountain terrains and San Francisco. And traditional tables of statistics are handy if your kid's teacher insists that Junior must know how much copra is exported from South America. But that stuff is for bean counters; the rest of us are happy just soaring around the world.

ABC World Reference: 3D Atlas / Creative Wonders / (800) 245-4525, (415) 571-7171 / $65 est. street price / *Reader Service No. 631*



WINGS OVER EUROPE ○○○○



WINGS KOREA TO VIETNAM ○○○○

I get an awful lot of CDs packed with multimedia about planes—usually fighter aircraft. But none of the discs pay homage to military aircraft as slickly or as enthusiastically as The Discovery Channel Multimedia's Wings over Europe and Wings Korea to Vietnam. The discs' cockpit interface is a bit complex, but when you figure it out, it lets you search a database of hundreds of planes linked to text, photos, diagrams, and videos. Not quite a Jane's All the World's Aircraft (the authoritative reference on military planes and ships). But it's pretty darn near, containing most of the details you'd want about planes of any era. The best feature, however, is the animation, which covers—with the same dispassionate technical curiosity—topics from how a jet engine works to how napalm kills.

Wings Over Europe; Wings Korea to Vietnam / The Discovery Channel Multimedia / (800) 762-2189, (317) 579-0400 / $40 each, est. street price / *Reader Service No. 632*



No Fear of Flying Here: All the details about planes from decades past.



DARK FORCES ○○○○

If you're a Doom fan, but you'd like a little more of a story line in the random mayhem, check out Dark Forces. This CD, which shot straight onto the best-seller charts, adds a Star Wars story line, complete with musical score, to the familiar Doom milieu of stalk and shoot. The Star Wars motif makes Dark Forces less imaginative than Doom wannabes like Heretic. If you get a sense of déjà vu, it's because the same plot has been used again and again on the big screen, TV, and in countless other games. But Dark Forces is still a good killing romp (if you can accept that idea). My only objection is that you can't save the action at any point or play it with friends over a network.

Dark Forces / LucasArts Entertainment / (800) 782-7927, (415) 721-3300 / $49 est. street price / *Reader Service No. 633*



THE BERENSTEIN BEARS GET IN A FIGHT ○○○○

This CD proves it: I've become an unrepentant old grouch. The Berenstein Bears Get in a Fight is based on the best-selling children's books by Stan and Jan Berenstein. They're so popular that I'm one of only three people who don't like them. I have a problem with the way the Bear brother and sister and their parents are all so nice to each other that they make Ozzie and Harriet look like serial killers. Luckily, this sugary facade doesn't last long, and the bear children quickly get real—which is to say, they yell and shove and throw tantrums, just like normal kids.

If you still find the story boring, amuse yourself by looking for clickables—objects that do something when you click on them, like sing a song or soar off the page. The clickables on this disc are always fresh and never obvious. (Click on a cuckoo clock, for example, and the bird doesn't just pop out and chirp the time—it announces a prizefight.) The artwork and animations will hold kids' short attention spans, although they take a backseat to plot development. The story itself has a predictably happy ending, and I suppose there's a good lesson for youngsters in it. But they're more likely to remember the fun.

The Berenstein Bears Get in a Fight / Living Books / (800) 397-4240, (415) 382-7818 / $40 est. street price / *Reader Service No. 634*

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HotList

Bookmarks of the Rich and Famous



You can tell a lot about people by looking at their lists of favorite sites on the World Wide Web. We recently swiped a copy of the bookmark list of Newt Gingrich, Speaker of the House, potboiler author, and presidential hopeful. Check out our reactions—below and online, at http://www.zdnet.com/~pccomp/

Hair Club for Men http://www.mcny.com/hairloss/book.html
While those pesky Dems say you're gonna switch old folks from nibbling caviar back to gumming Alpo, that sympathetic silver mane of yours is worth a lot of senior votes. Besides, a right-winger like you never liked Whigs anyway.



Family Fat Farm http://www.shore.net/~lerusse/slbhome.html
Sure, a smart presidential candidate never turns down local food on the campaign trail. But now that you're buying suits in the portly section, stick with kissing babies, not eating them. And we know one farm subsidy you're not going to cut.

Legal Research http://www.lawworld.com/
Nope. We checked. No matter how hard the NRA and Christian Coalition try, they really can't legally replace the Bill of Rights with the Contract with America. Or edit the Preamble to the Constitution to begin "We, the White people, . . . "

Thesaurus http://www.notredame.ac.jp/Roget/data/about.html
Don't know how your mom did it, but after her 15 minutes of tube time, both Connie and Hillary are history. Bitchin'. Maybe you can teach the old sweetie some new words for Bill, Bob, Pete, Lamar, and Phil.

Club Med http://www.clubmed.com/cm/pages/homepage
Time for a few congressional inspection trips to see how NAFTA has affected typical working-class Mexican areas like Puerto Vallarta or Cancun? *Hmmm*, does the Winter White House have to be north of the border?



Political Contributions http://www.cais.com/newtwatch/pacSindx.html
Congressional ethics—geez, that's a worse oxymoron than *military intelligence* or *civil service*. OK, you made one little slip, but tell those liberals that at least nobody committed suicide over it.

Genealogy http://www.sfo.com/~genealogysf/dos.html
Too bad for you it had to be something elitist-sounding like Gingrich. Check it out—maybe some ancestor changed it from Newt Sixpack. Then you can tell those class clowns Bonior and Gephardt to soak *this*.

Letterman Home Page http://www.cbs.com/lateshow/latestar.html
We heard you've been fuming ever since his November 4, 1993, show featured the top ten ways to mispronounce your name. Remember that other kind of list Tricky Dick used to maintain?



Swiss Bank Account http://www.nets.com/private.investments/
Memo to your CPA: The separation of powers doesn't mean publishers' *checks* should increase your savings *balances*. A foreign investment like this just wouldn't be prudent.

Herpetology http://www.concorde.com/~chaos/herps/
We have a national bird; don't we need a national reptile? Oops, forgot about Jesse. Never mind.

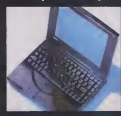
Speakers' Bureau http://www.publicspeaker.com/
OK, here's the plan. You convince Bubba he'll clean up like a bandit once he's out of D.C. Heck, if someone as out of touch as Ronnie can pull down a couple million in Japan, think what a down-home goober like slick Willie can make.

Military History
http://neal.ctstateu.edu/history/world_history/archives/archive.html
World War II novelist Gingrich really poured on the details of blood, sweat, and tears—and this was just in the sex scenes. Hey Newtie, that's not what they meant by the "Battle of the Bulge."



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†The VeriTest Coast-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® 3.11 during an airplane flight. Power management was enabled and 8MB RAM was installed. VeriTest, inc. is located in Santa Monica, CA. Promotional pricing is not discountable.

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